What is Infra-red Photography?

In infrared photography, the film or image sensor used is sensitive to infrared light. The part of the spectrum used is referred to as near-infrared to distinguish it from far-infrared, which is the domain of thermal imaging. Wavelengths used for photography range from about 700 nm to about 900 nm. Usually an "infrared filter" is used; this lets infrared (IR) light pass through to the camera, but blocks all or most of the visible light spectrum (the filter thus looks black or deep red).

When these filters are used together with infrared-sensitive film or sensors, very interesting "in-camera effects" can be obtained; false-colour or black-and-white images with a dreamlike or sometimes lurid appearance.

The effect is mainly caused by foliage (such as tree leaves and grass) strongly reflecting in the same way visible light is reflected from snow. There is a small contribution from chlorophyll fluorescence, but this is extremely small and is not the real cause of the brightness seen in infrared photographs.

The other attributes of infrared photographs include very dark skies and penetration of atmospheric haze, caused by reduced Rayleigh scattering and Mie scattering, respectively, compared to visible light. The dark skies, in turn, result in less infrared light in shadows and dark reflections of those skies from water, and clouds will stand out strongly. These wavelengths also penetrate a few millimetres into skin and give a milky look to portraits, although eyes often look black.
Digital cameras

Digital camera sensors are inherently sensitive to infrared light, which would interfere with the normal photography by confusing the autofocus calculations or softening the image (because infrared light is focused differently than visible light), or over saturating the red channel. Also, some clothing is transparent in the infrared, leading to unintended (at least to the manufacturer) uses of video cameras. Thus, to improve image quality and protect privacy, many digital cameras employ infrared blockers known as a ‘Hot Plate’. Depending on your subject matter, infrared photography may not be practical with these cameras because the exposure times become overly long, often in the range of 30 seconds, creating digital noise and motion blur in the final image. There are ways around this and tutorials can be found that offer advice to removing the hot plate from your camera but this is not recommended.

However, for some subject matter the long exposure does not matter or the motion blur effects actually add to the image. Some lenses will also show a 'hot spot' in the centre of the image as their coatings are optimised for visible light and not for IR. The wider the lens the more prone it is to having a ‘hot spot’.

An alternative method of digital SLR infrared photography is to remove the infrared blocker in front of the CCD and replace it with a filter that removes visible light. This filter is behind the mirror, so the camera can be used normally - handheld, normal shutter speeds, normal composition through the viewfinder, and focus, all work like a normal camera. Metering works but is not always accurate because of the difference between visible and infrared reflection. When the IR blocker is removed, many lenses which did display a hotspot cease to do so, and become perfectly usable for infrared photography.

Since the Bayer filters in most digital cameras absorb a significant fraction of the infrared light, these cameras are sometimes not very sensitive as infrared cameras and can sometimes produce false colors in the images. An alternative approach is to use a Foveon X3 sensor, which does not have absorptive filters on it; the Sigma SD10 DSLR has a removable IR blocking filter and dust protector, which can be simply omitted or replaced by a deep red or complete visible light blocking filter. The Sigma SD14 has an IR/UV blocking filter that can be removed/installed without tools. The result is a very sensitive digital IR camera.

Several Sony cameras have the so-called Night Shot facility, which physically moves the blocking filter away from the light path, which makes the cameras very sensitive to infrared light. Soon after its development, this facility was 'restricted' by Sony to make it difficult for people to take photos that saw through clothing. To do this the iris is opened fully and exposure duration is limited to long times of more than 1/30 second or so. It is possible to shoot infrared but

neutral density filters must be used to reduce the camera's sensitivity and the long exposure times mean that care must be taken to avoid camera-shake artefacts.

Fuji have produced digital cameras for use in forensic criminology and medicine which have no infrared blocking filter. The first camera, designated the S3 PRO UVIR, also had extended ultraviolet sensitivity (digital sensors are usually less sensitive to UV than to IR). Optimum UV sensitivity requires special lenses, but ordinary lenses usually work well for IR. In 2007, Fuji Film introduced a new version of this camera, based on the Nikon D200/ FujiFilm S5 called the IS Pro, also able to take Nikon lenses. Fuji had earlier introduced a non-SLR infrared camera, the IS-1, a modified version of the FujiFilm FinePix S9100. Unlike the S3 PRO UVIR, the IS-1 does not offer UV sensitivity.

Satellite sensors and thermographic cameras are sensitive to longer wavelengths of infrared, and use a variety of technologies which may not resemble common camera or filter designs. In particular, they often require cooling, since at these wavelengths, and room temperature, all objects (including the camera body, the optics, and the detector itself) are glowing all the time. Tips and tricks. Use a tripod. Use a high F-stop eg: f22. Manually adjust your shutter speed and exposure. If your camera has noise reduction use it. Play with contrast in post