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Chapter 1 : A Short Course in Digital Photography | eBay

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Generally pixels per inch refer to the image and display screen and dots per inch refer to the printer and printed image. Sometimes I think terminology shifts like this are done just to confuse us. In this book we use them interchangeably For comparison purposes, monitors use an average of 72 ppi to display text and images, ink-jet printers range up to dpi or so, and commercial typesetting machines range between 1, and 2, dpi. Image Sensors Just as in a traditional camera, light enters a digital camera through a lens controlled by a shutter. Digital cameras have one of three types of electronic shutters that control the exposure: A timing circuit tells it when to start and stop the exposure Electromechanical shutters are mechanical devices that are controlled electronically. Electro-optical shutters are electronically driven devices in front of the image sensor which change the optical path transmittence. From Light Beams to Images When the shutter opens, rather than exposing film, the digital camera collects light on an image sensorâ€"a solid state electronic device. As the lens focuses the scene on the sensor, some photosites record highlights, some shadows, and others record all of the levels of brightness in between. Image sensors are often tiny devices. Each site converts the light falling on it into an electrical charge. The brighter the light, the higher the charge. When the shutter closes and the exposure is complete, the sensor "remembers" the pattern it recorded. The various levels of charge are then converted to digital numbers that can be used to recreate the image. Image sensors contain a grid of photosites that convert light shining on them to electrical charges. These charges can then be measured and converted into digital numbers that indicate how much light hit each site. These two illustrations show how image sensors capture images. When an image is focused through the camera or scanner lens, it falls on the image sensor. Varying amounts of light hit each photosite and knock loose electrons that are then captured and stored. The number of electrons knocked loose from any photosite is directly proportional to the amount of light hitting it. When the exposure is completed, the sensor is like a checkerboard, with different numbers of checkers electrons piled on each square photosite. When the image is read off the sensor, the stored electrons are converted to a series of analog charges which are then converted to digital values by an Analog-to-Digital A to D converter. Progressive Scan Once the sensor has captured an image, it must be read, converted to digital, and then stored. The charges stored on the sensor are not read all at once but a row at a time. There are two ways to do thisâ€"using interlaced or progressive scans. These kinds of sensors are frequently used in video cameras because television broadcasts are interlaced. On an interlaced scan sensor, the image is first read off every other row, top to bottom. The image is then filled in as each alternate row is read. The search for color was a long and arduous process, and a lot of hand coloring went on in the interim causing one author to comment "so you have to know how to paint after all! He had the photographer, Thomas Sutton, photograph a tartan ribbon three times, each time with a different one of the color filters over the lens. The three images were developed and then projected onto a screen with three different projectors, each equipped with the same color filter used to take its image. When brought into register, the three images formed a full color image. Over a century later, image sensors work much the same way. Additive Colors Colors in a photographic image are usually based on the three primary colors red, green, and blue RGB. This is called the additive color system because when the three colors are combined in equal quantities, they form white. This system is used whenever light is projected to form colors as it is on the display monitor or in your eye. The first commercially successful use of this system to capture color images was invented by the Lumerie brothers in and became know as the Autochrome process. They dyed grains of starch red, green, and blue and used them to create color images on glass plates. RGB uses additive colors. When all three are mixed in equal amounts they form white. When red and green overlap they form yellow, and so on. For more on color, visit The ColorCube Web site. On the monitor, each pixel is formed from a group of three dots, one each for red, green, and blue. On the screen, each pixel is a single color formed by mixing triads of red, green, and blue dots or LCDs. This system, called subtractive colors, uses the three primary colors Cyan, Magenta, and Yellow hence the CMY in the nameâ€"the K stands for an extra black. When these three colors are combined in equal quantities, the result is a reflected black because all of the colors are subtracted. When you combine cyan, magenta, and yellow inks or pigments, you create subtractive colors. On a printout, each pixel is formed from smaller dots of cyan, magenta, yellow, and black ink. Where these dots overlap, various colors are formed. This brief animation zooms in on a part of an inkjet print to show you increasing levels of detail. Courtesy of Trevor Anderson. Basically, they only capture brightness. The gray scale contains a range of tones from pure white to pure black. How then, do sensors capture colors when all they can do is record grays? The trick is to use red, green, and blue filters to separate out the red, green and blue components of the light reflected by an object. Likewise, the filters in a CMYK sensor will be either cyan, magenta, or yellow. There are a number of ways to do this, including the following: This way each image sensor captures the image in a single color. Three separate exposures can be made, changing the filter for each one. In this way, the three colors are "painted" onto the sensor, one at a time. Filters can be placed over individual photosites so each can capture only one of the three colors. In this way, one-third of the photo is captured in red light, one-third in blue, and one-third in green. Each pixel on the image sensor has red, green, and blue filters intermingled across the photosites in patterns designed to yield sharper images and truer colors. The patterns vary from company to company but the most popular is the Bayer mosaic pattern shown here behind the image sensor. From Black and White to Color When three separate exposures are made through different filters, each pixel on the sensor records each color in the image and the three files are merged to form the full-color image. However, when three separate sensors are used, or when small filters are placed directly over individual photosites on the sensor, the optical resolution of the sensor is reduced by one-third. This is because each of the available photosites records only one of the three colors. For example, on some sensors with 1. Does this mean the resolution is still 1. Each site stores its captured color as seen through the filter as an 8-, , or bit value. To create a , 30, or bit full-color image, interpolation is used. By combining these two interpolated colors with the color measured by the site directly, the original color of every pixel is calculated. Here the full-color of the center green pixel is about to be interpolated from the colors of the eight surrounding pixels. HP has introduced a process called demosaicing that interpolates colors using a much wider range of adjacent pixels. Color Channels Each of the colors in an image can be controlled independently and is called a color channel. If a channel of 8bit color is used for each color in a pixelâ€"red, green, and blueâ€"the three channels can be combined to give bit color. When an image is open in Photoshop, a dialog box shows the red, green, and blue channels so you can select the one you want to work on. The top image in the dialog box is the combined bit RGB. Color Aliasing When interpolation is used, there has to be enough information in surrounding pixels to contribute color information. Low-resolution image sensors have a problem called color aliasing that occurs when a spot of light in the original scene is only big enough to be read by one or two pixels. Another form of color aliasing shows up as out of place color fringes surrounding otherwise sharply defined objects. They will explore every possible combination to see which works best. The market determines the eventual winners in this "throw them against the wall and see what sticks" approach. At the moment, designers have two types of components to play with: Area-array Sensors Most cameras use area-array sensors with photosites arranged in a grid because they can cover the entire image area and capture an entire image all at once. Area array image sensors have their photosites pixels arranged in a grid so they can instantly capture a full image. These area array sensors can be incorporated into a camera in a variety of ways. This is the most common form of image sensor used in consumer-level digital cameras. A different colored filter is placed in front of the image sensor for each of the colors. Two-chip cameras capture chromonance using one sensor usually equipped with filters for red light and blue light and luminance with a second sensor usually the one capturing green light. Two-chip cameras require less interpolation to render true colors. Three-chip cameras, such as one from MegaVision, use three full frame image sensors; each coated with a filter to make it red-, green- or blue-sensitive. A beam splitter inside the camera divides incoming images into three copies; one aimed at each of the sensors. This design delivers highresolution images with excellent color rendering. However, three-chip cameras tend to be both costly and bulky. Linear Sensors Scanners, and a few professional cameras, use image sensors with photosites arranged in either one row or three. Cameras with these sensors are useful only for motionless subjects and studio photography. However, these sensors are widely used in scanners. As a linear sensor scans an image a line at a time it gradually builds up a full image.

Chapter 2 : A Short Course in Digital Photography - PDF Free Download

*A Short Course In Photography [Barbara London, Jim Stone] on racedaydvl.com *FREE* shipping on qualifying offers. This easy-to-use text introduces photography students to the fundamentals of photography and suggests ways in which they might create photographs that have meaning.*

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A Short Course in Photography: Film and Darkroom An Introduction to Photographic Technique, Books a la Carte Edition (10th Edition) 10th Edition.

Chapter 4 : A Short Course In Photography: Barbara London, Jim Stone: racedaydvl.com: Books

Just released is our new guide A Short Course in the Fine Art of Classic Fuji XT Photography. This innovative new camera, reminiscent of the once hugely popular Leica, is creating quite a buzz in the photographic community.

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A Short Course in Photography emphasizes your choices in picture making: How to look at a scene in terms of the way the camera can record it How to select the shutter speed, point of view, or other elements that can make the difference between an ordinary snapshot and an exciting photograph.

Chapter 6 : A Short Course in Photography: Digital by Jim Stone

A review of the book "A Short Course in Digital Photography" by Barbara London and Jim Stone, Prentice Hall, ISBN , ISBN Photographers, students, and teachers are always asking me for book recommendations on digital photography and for tips on improving their photography technique.

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Course(s): Food Photography Sammy's passion is food photography and styling. Sammy is the photographer for the mouthwatering cookbook, The Middle Brighton Baths (), which features not only food but also the interiors and exteriors of the building and surroundings.

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