Documenting Your Work

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Equipment

A good camera and lens are essential ingredients to creating good images. While film cameras can produce adequate quality images, they require more experience to create proper exposures and lighting temperature, as well as add the need to have the film scanned. If film is used, have it scanned when it is processed by your lab. Once film is cut, it will be much more expensive to have it scanned. Doing the scanning yourself means requiring a high quality scanner and knowing how to use it. So film should be avoided. Most current digital cameras, on the other hand, produce more than adequate resolution, which is usually talked about in megapixels. Web-resolution images, and images that can be attached to emails, are usually less than a megapixel! However, anything above 6 megapixels will not only be able to be used for digital portfolios, but also be able to be reproduced in print. For example, uncropped, 6 megapixels (2000 x 3000 pixels) can be readily printed up to 8”x12”.

Your camera does not have to be particularly expensive, but it should have a few basic features that can mean the difference between mediocre and excellent images. First of all, it is important to understand that there’s far more to image quality than megapixels. For that reason, it is advisable to use a digital SLR. Single-Lens-Reflex cameras generally have sharper lenses than point-and-shoot cameras. Secondly, they have larger image sensors. Larger image sensors “see” more light, and produce data with higher signal-to-noise ratios. You have probably seen the green and purple “noise” in images scenes with low light. Larger sensors produce cleaner images. Digital SLRs are now so prevalent that most people will at least know someone who has one. In larger cities, they can also be rented. As for lenses, fixed-focal length lenses are usually sharper than zoom lenses. Ideally you would use a 50mm or 80mm lens. Alternatively, use a zoom lens set somewhere between 50mm and 80mm. A more wide-angle focal length can distort your image, while a telephoto lens will force you impractically far from your work. Finally, you will certainly need a sturdy tripod.

Lighting

First, think about lighting. Lighting doesn’t have to be fancy... it has to be even. Diffuse natural light on a cloudy day, or diffuse indirect light on sunnier days, will probably be your simplest solution. Stay near a window, but keep sunlight from shining directly on your work in a way that will create harsh shadows. If you are using lights, put even

amounts of light on either side of the work, aimed at 45° angles. Digital cameras compensate well for the different “temperatures” of light, which vary greatly from indoor to outdoor, time of day, cloud-cover, and reflected or direct. Films are not tolerant of these differences; they are formulated for specific lighting conditions, making lighting more difficult. In either case, however, fluorescent light sources should be completely avoided. Your work should be photographed before it is framed or put behind glass. If you must photograph reflective surfaces, for example, if your work itself is reflective, be aware of what it is reflecting. You may need to surround your work as much as possible with blank white surfaces. In the case of two-dimensional yet reflective work, face it toward a white while, and stand to the side until you cannot see yourself reflected in the work. Such an image will then have to be de-skewed in image-editing software, and have its contrast increased there as well, so photographing work behind glass should be avoided. Except in the case just mentioned, you should otherwise face two-dimensional work straight on, keeping the plane of the work parallel to the plane of your camera. You can often eyeball this well enough by looking at the edges of your work relative to the edges of the camera’s viewfinder.

Camera Setup

In addition to a tripod, the last frontiers of sharpness are achieved with a cable release or remote release, and mirror-lockup. The cable or remote release allows you to release the shutter without touching (ie, jiggling) the camera. With SLRs, there is a mirror that reflects light from the lens up through a penta-prism and through the viewfinder to your eye. This mirror flips up during exposure to allow the light through the shutter and to the film or sensor. Some cameras also have the ability (check your manual) to lock the mirror up prior to the exposure, allowing the tiny vibrations caused by the mirror’s movement (“mirror-slap”) to dissipate before the shutter is opened. If you do not have a cable release and mirror-lockup, try to avoid shutter speeds between 1/2 second and 1/60 second, by adjusting your lighting, your ISO, and your aperture. Remember, however, that a sturdy tripod, a sharp lens, and careful focussing are the most crucial ingredients to a sharp picture.

Exposure

Once you are set up on a tripod and have framed the work in your viewfinder, you can make sure you have the right camera settings. Check your camera’s manual if you are not sure how to do any of the following things. First, your digital camera must be set to capture either RAW images, or the best quality .jpeg. Your camera’s best quality .jpeg will usually be called “HQ”, “Fine” or sometimes “Super Fine.” Again, digital cameras can balance the white-point of your data to match the “white” of your lighting. They usually

do this well all on their own, so either experiment with the various “White Balance” settings or simply set the camera to “AWB” (automatic white balance). Then, if you are able, use an ISO of less than 400. Next, if you are able, your lens aperture should be set between f5.6 and f11. The best way to do this is to the use “Aperture Priority” mode on your camera. All SLRs and some point-and-shoot cameras will have this mode, and it is usually on a dial and designated by an “A”. In aperture priority mode, you select the size of the lens opening, then the camera will meter the light and select what it thinks is the best shutter speed, which is the duration for which the sensor (or film) will be exposed to light. You may need to use exposure compensation or manual mode (M) to change the shutter speed differently than what the meter indicates. Cameras universally expose for subject matter as if it was middle-toned. Therefore, the metered exposure will tend to overexpose predominantly dark work and underexpose predominantly light work. However, work that is tonally well-balanced and evenly lit should expose well at the metered setting. Perhaps the greatest advantage of digital cameras is that you can check the exposure after making it. In playback mode, look at the picture, but do not merely trust your camera’s screen. Toggle through the various “Display” or “Info” modes until you see what is called a “Histogram.” A histogram graphically represents the values of each pixel in the image. The number of black pixels in the image will be graphed vertically on the left, and the number of white pixels in the image will be graphed vertically at the right; all the other values will fall in between. Some histograms also separate each colour channel, because, in a colour image, each pixel has a red, a green, and a blue value. In a good exposure, the bulk of the “mountain range” created by this graphing of values should fall well within the two extremes. “Clipping” of shadows and highlights occurs when under or over exposed areas are rendered as pure black or pure white, and detail is lost. Good images should have very few pure blacks and whites, rather, a smooth gradation of detail through values in between.

Image Storage

First of all, save your files in an organized way that will anticipate your future needs. Do not leave the files with useless names like “IMG1001.” Each filename should have your full name, the work’s full title, and the date of the work as well, especially if you intend to send files to other people. Be consistent, and don’t assume that you will always remember where you put things, or how you named them. More information is better than less, so you may also want to include in the filenames an absolutely unique serial number system, not only for your work, but for the various images you may have of the same work. For example, sculpture may benefit from being photographed from multiple angles. File names and other metadata (information about the file embedded within the file, such as capture time), are the most powerful way of organizing files in the long term. If you use folders to organize your files, keep the structure simple. If you can,

backup your images on another hard disk. Always keep your source or primary data separate from your backup or secondary data. Modify only the primary, and update the secondary correspondingly and regularly. Hard drives do fail eventually, and retrieval is often expensive and not even always possible.

File Size and Quality

This is where the endless possibilities prevent us from being able to tell you exactly where to go. But we can give you some pointers. There are a few things to understand about image quality and resolution, regardless of what image-editing software you use. If you are familiar with some digital cameras' ability to capture RAW images, you should capture and keep RAW images of your work rather than JPEG images. If you do not understand RAW image capture (it's not hard to learn about!), then make sure you have captured the highest quality JPEG your camera allows. Whatever your original file type, you should always leave a copy of your original unedited file, named, for example:

"VincentVanGogh1889_StarryNight_18890405A_ 73cm×92cm_original.jpg"

Some editing software, like Adobe Lightroom, or Google Picasa Remember that the JPEG file format is always a compressed file format, although JPEGs are compressed to varying degrees, and quality is lost accordingly. Even if you keep your JPEG quality high, you should keep the number of generations between your original file and your final output to a minimum. In other words, when you open your original file and make changes, save the manipulated image as a new copy. Then, if you don't like what you've done, you can go back to your original file. Even a lossless compressed format like .png (Portable Network Graphics) or a lossless and minimally compressed format like .tiff (Tagged Image Format), can lose data over multiple generations of saving, for example, if you increase contrast to the point of clipping data, or make a black and white. If a shadow area that contained details in varying dark greys gets rendered pure black, and the file is saved, that shadow detail will be lost. No matter what file format you use, therefore, you should always keep an original, unedited copy. However, JPEG compression introduces another kind of quality loss, which you can think of as corner-cutting. To reduce file size, you may want to save a JPEG at only 80% quality, so certain information gets grouped together and the digital description of the image becomes shorter. The shorter description (smaller file) is useful for decreasing download times for websites and email. However, too much compression (less than 80% quality), begins to make for a bad digital description of your image.

Other than file-types and compression levels, there is another important aspect to file size and image quality. That is the number of pixels that make up an image. More pixels means more detail can theoretically be displayed, but it also means bigger files. Since

hard drives are big and fairly cheap, file size, again, becomes an issue only when files are being passed over slow networks like the web, through email or websites. However, since these are very important tools for displaying your work, it is crucial to understand pixel dimensions. First, note that megapixels aren't the best description of the number of pixels in an image. For example, an image that is 1000 pixels by 1000 pixels, and an image that is 500 pixels by 2000 pixels, are both 1 megapixel images. Megapixels are just the total number of pixels in the rectangular image. They do not tell you the aspect ratio of the rectangle. Secondly, it is very important to realize that DPI (dots-per-inch) means almost nothing by itself. From now on, we'll talk about PPI (pixels-per-inch) to avoid confusion with the number of dots of ink that printers can cram into an inch. We're talking about image resolution, not printer resolution. PPI is relative to display size, measured in inches. The number of pixels in an inch does not tell you the size of the image unless you know the image's dimensions in inches as well. It would be far less confusing for people to speak in pixel dimensions, like 600x900, or 2400x3600, which are absolute. Both of those image sizes can be set to 300 PPI, in which case, the first would make a 2"x3" print, and the second would make an 8"x12". Put another way, the 600x900 image printed at 2"x3" will contain 300 pixels-per-inch, but only 200 pixels-per-inch when printed at 3"x4.5". Furthermore, "inches" only come into play when printing (or scanning), and can be ignored with respect to the web, since displays are measured in absolute pixels dimensions as well (1024x768, 1280x1024, 1280x1024, 1680x1050, etc.) All you need to know about PPI is that you want at least 200 ppi in a print, depending on viewing distance, because of what the human eye can resolve. Therefore, the pixel dimensions of your image will tell you what size you can print it at. A 2000x3000 image can be printed any size up to about 10"x15". If you start to spread the same number of pixels over more inches, you will begin to be able to see pixels, depending on how far away you view the image. Obviously, the point of pixels is to blend together to create the illusion of smooth gradations of tone and colour, so that you see an image, not the pixels.

Again, you should keep your original file with its native pixel dimensions. From there, you will want to make "down-sampled" copies for the web and email. You are throwing away information for the sake of file size. Usually a JPEG of about 600 to 800 pixels on the larger dimension, saved at 90% quality, will be a suitable size for email (300-600Kb file size). For websites, 400 to 600 pixels, saved at 80% quality, will be suitable for websites (100-200Kb file size). You may need or be asked for specific sizes, so it's important to understand how pixel dimensions and compression affect file size, but also image resolution and quality.

Image Manipulation

As for manipulating your images, it may be tempting to increase contrast or saturation. But contrast and saturation can easily be overdone, jeopardizing both image quality and faithfulness to your work. Image-editing software will often be able to display a histogram of your image, just like the camera did. Try to keep the mountain range within the extremes, but with some areas approaching black, and some approaching white, if your work has pure blacks or whites. Try not to clip detail. The best way to make value adjustments is with “Curves” if your software allows it, rather than with “Brightness” or “Contrast”. With respect to both tonality and colour, your computer monitor may not be perfectly accurate. There are tools online to help you check and calibrate your display to be reasonably accurate. If you have shot your two-dimensional work straight on, you should not need to de-skew your image (make it square). Very few, if any, of the free and easy-to-use softwares, like Google’s Picasa, have this feature. But even such simple software will allow you to crop and rotate, resize, and make simple tonal and colour adjustments to your image. The key, of course, is to photograph it well in the first place. The more carefully you light, set-up, and expose your image, the more pain-free your post-processing experience will be.