

Ultimate Contrast Management:

HIGH DYNAMIC RANGE PHOTOGRAPHY

Shutter Release, February 2009

High dynamic range photography is a term that has evolved to mean digitally merging multiple exposures of the same composition but of varying brightness, to produce a single image with lower contrast than would otherwise be possible. Through this technique, extremes of lighting can be greatly reduced if not eliminated, by first suitably exposing all significant areas of the image through multiple takes as required, then applying Photoshop (ideally CS3 or CS4, as of this writing) or other specialized program to automatically select and combine the best exposure segments into one uniformly optimal image. Either digital or (scanned) film imagery may be applied in the process. Use of a tripod in high dynamic range photography was originally considered a must, but with improvements in image stabilization as well as digital processing, hand-held multiple exposures are often workable. People pictures, however, continue to be problematic as with any technique of multiple exposure.

The Need for Contrast Management

Conventional wisdom about balanced exposure in photography has yet to be overturned: All significant areas of an image should be adequately exposed to make the details of the subject visible: not too dark or too bright. Images that violate this seemingly natural dictum will often seem flawed to the eye or otherwise wanting. (Nevertheless, occasionally an abstract photograph of this nature will be understood and appreciated as an intended exception to the rule, if skillfully styled and crafted.)

Stepping back, it should be noted that contrast management is usually not a problem. The majority of photographic situations are more or less evenly illuminated, or involve flash or other fixed lighting, and as such do not require special effort to reduce contrast. Yet photography under conditions of diverse illumination, ranging from dark shadows to bright sunshine or similar extremes, has always been a challenge, especially in landscape, architectural, and travel photography in general.

The capability to accommodate extremes of bright and dark illumination in capturing a single image is called “Dynamic Range.” Digital sensors and films have a measurable capacity, quantitatively expressed in f-stops or “zones,” to record detail within a range of greater to lesser illumination. In practice, premium digital sensors have broader dynamic range than films. Among the latter, color negative film has the widest dynamic range, followed by black-and-white film. Color transparency film has the narrowest dynamic range, a positive aspect of which is its ability to capture and expand upon beautifully delicate hues.

Prior to and continuing into the digital era, a number of means have been employed since the origins of photography to improve upon the dynamic range of film. In some contrasty situations, graduated neutral (gray glass or plastic) filters can be applied in the photographic process to darken contiguous brighter areas of an image. More frequently, film exposure is set somewhat brighter than normal, to better record darker areas; later in the darkroom, larger segments considered too bright are “burned in” (darkened). Areas that are too dark can likewise be “dodged” (brightened) to a lesser extent. But sometimes the darker and lighter areas are too intertwined for such techniques to be workable in the traditional darkroom. Nevertheless, these capabilities were carried forward to digital photography, including “burning” and “dodging” in original and contemporary Photoshop, but with limited effectiveness in my experience.

Emergence of High Dynamic Range Photography

Around 2005 a paradigm shift emerged. The design, capacity and speed of digital imaging were improved to the point that desktop computing could be applied to analyze and selectively merge the best-exposed segments of multiple exposures of identical compositions of different brightness (Photoshop CS2) and more recently, optimize and create a single, optimized image from up to 20 near-identical compositions of different brightness (Photoshop CS3 and CS4).

Basic Technique

In its most practiced form, a photographer appreciating that a high-contrast composition could benefit from high dynamic range photography would use a tripod, or if not feasible, a premium high-speed digital or film camera with capability of 4+ frames per second. In principle, of course, movement should not occur within the scene.

At minimum it is necessary to take at least three identical or near-identical images of the high-contrast composition, typically using automatic bracketing through which the camera is programmed to automatically adjust exposure from the indicated “average” exposure for the entire scene, to plus and minus one to two f-stops. Alternatively, for an especially contrasty scene, the photographer may wish to take many more exposures; as a rule, the more exposures the better, unless the possibility of movement within the composition (e.g., from wind or people) dictates as short an overall exposure time as possible. If film is used, the developed imagery must of course be digitally scanned.

An example of ultimate benefit from High Dynamic Range Photography would be photography of a dimly lit room with picture window looking out on a bright sunny day. Ideally both the room and the outside view should be suitably exposed. With an exposure range of 6 to 8 f-stops or zones, no single digital or film image could adequately capture the scene (unless the photographer were to wait for sunset!) Applying high dynamic range photography, the camera would be placed on tripod, and a series of alternative exposures taken ranging from average exposure for the scene as a whole, to plus and minus 3 or 4 f-stops (or more precisely, the exposures necessary to capture full detail of the sunny day as well as in the room.) The images would be duly inputted for digital processing, and Photoshop (or other specialized program) applied. In brief, using Photoshop CS2, CS3 or CS4, the multiple exposures can be selected in Bridge, then executed in Tools > Photoshop > Merge to HDR. The resulting composite photograph would require tonal and other adjustment, but the basis for perfection of a most difficult composition, which for most of the history of photography would have been impossible to capture, will have been created.

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