

High Dynamic Range Photographs

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The human eye adjusts automatically to the available light so that a person can see a more optimal amount of detail in a situation – if there is a lot of light, the pupil contracts so that it is not too bright, and if it is very dark the pupil expands so that the shadows have more detail in them. Thus, when a person is looking at a scene in which there are bright spots and dark spots, the eye adjusts itself so that detail can be seen in both. Cameras, however, are not as optically advanced as the human eye, and cannot handle a high-contrast lighting situation well. Either the camera settings are adjusted for the very bright areas, leaving the darker spaces hopelessly dark, or the settings are adjusted for the dark areas, leaving the bright highlights clipped out with no differentiation. A High Dynamic Range (HDR) image is one in which postprocessing is used to take a high-contrast image and force details out of the shadows and the highlights, so that the scene depicted more closely matches what one would see if looking with a naked human eye.

There are two methods that can be used to decrease the contrast in a reasonable way. One is to take multiple photographs that are each exposed properly for the different lighting situations and then merge them in Photoshop. The other is to take a RAW image, which has enough data in it to either pick out the highlights or the shadows, although not both at once, and then make multiple copies of the same image at different exposures and merge them instead. This avoids the problem caused by movement between multiple exposures of the same image, which happens when you take multiple photographs. However, often a single RAW image does not contain as much information as separate exposures and so the adjustments do not look ideal.

For my project I chose to use the single RAW image so that I could have people in my photographs without causing odd ghosting effects, and also to avoid difficulties in aligning scenes taken with a wide-angle lens, because the curvature in the scene can never align perfectly unless a tripod is used on a timed exposure, which would mean that there could be no people in the image.

To merge the images, the two adjusted versions of a RAW photograph are opened in Photoshop as smart objects. Then, the darker image is copied onto the lighter one as a new layer, with a layer mask. The contents of the lower (lighter) layer are then copied into the layer mask and blurred slightly with a Gaussian blur (radius 1.5 pixels). The levels of the mask are then tweaked slightly so that the contrast is increased enough to look natural, while still retaining detail in the highlights and shadows.