

Exposure with a digital SLR in situations of high contrast

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Note: The following requires understanding the basics of exposure and how to read a histogram.

In general it is not that difficult to find a decent exposure in a situation when the contrast of a scene is low. It is high contrast situation that brings difficulties in finding a good exposure. In situations of a low contrast it is enough to put your camera in Matrix (Evaluative) measuring mode and, apart from slight exposure compensation from time to time, we would not have any problems capturing our images with a good exposure. In situation of a high contrast Matrix metering might give priority to certain areas which are of less importance to us. In these situations we need to be more selective with our measurement of light and also more precise in order to capture as much detail as possible.

Here is an example of a scene with high contrast:

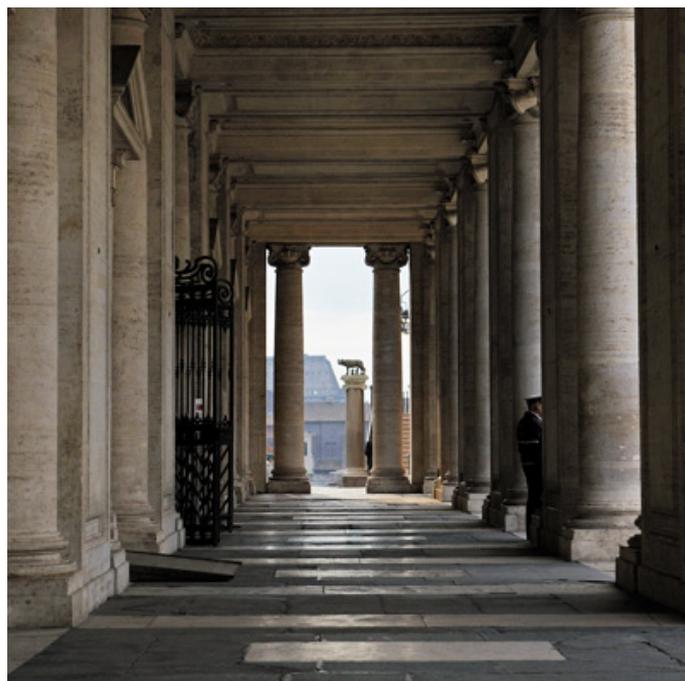


photo 1: example of a final photo after few modifications in RAW editing software

This is a situation with a high contrast range when one area is much darker (under the columns) and another area is much brighter (the sky around she-wolf and above the roof of the Colosseum). This difference between the lightest and the darkest area - contrast range of a scene - is outside of capabilities of a typical digital SLR (dSLR). In other words we will be unable to capture in one photo all details in the shadow under columns and the sky outside. There is a technique of merging multiple photos taken with different exposures into one called High Dynamic Range (HDR). It is a very valid technique and, if you master HDR editing, can give you very interesting results. However, this technique cannot be applied to the moving

subjects and in general HDR photography will require more time in photographing process and in post production. In any case, before you start learning HDR photography you will need to master a tight exposure control first. This will significantly reduce your time in taking a photo, produce files which are better prepared to HDR and consequently will also reduce your post production time.

Today we will concentrate on how to capture maximum amount of detail in one shot in such a way that it helps us to reduce time dedicated to post production.

The first thing that we need to be aware of is what is happening with those parts of our photo which were excessively over- or underexposed.

Overexposure

If we overexpose some areas of our photo to the level when we start to lose details, we say that we “burned” or clipped this area. This means that in this area the photo-sites of our sensor became over-saturated with the amount of light they were exposed to and thus were unable to distinguish anymore variations in the level of luminosity. We have effectively “burned” those pixels.

After you have taken the photo, you can identify areas that were burned by using a special feature in your dSLR. This feature is called “highlights” information page where you will see the burned areas blinking as a warning of overexposure. What your camera is trying to tell you, is that those blinking areas were exposed to the maximum level and that no details in those areas were registered - they became absolutely white. Normally you don't want anything blinking on your photo unless it was your choice to render certain areas as absolutely white without any details.

Once an area of a photo was burned, it is practically impossible to recover details from those areas if we were shooting in JPEG. Sometimes you can recover some details if you were shooting in RAW format. You would need a RAW editing software for this. You can recover up to one third of a stop, but the result would be slightly or much inferior if your were to shoot the same photo without overexposure.

Underexposure

If we underexpose certain areas of our photo, it is relatively easy to recover some details, especially if a photo was taken with a low sensitivity (ISO). Again from RAW file we will be able to recover more details with less visible noise appearing in the recovered zones. It is possible to recover up one or one and a half stop from underexposed areas if the photo was taken with the base ISO of a modern dSLR. Base ISO is not always the lowest ISO setting of your camera. You will need to consult your camera's technical specifications to see what the base ISO of your camera is. The higher ISO was set during exposure, the less details we can recover without excessive noise appearing in those areas.

And so you can see that digital capture is more tolerant to underexposure than it is to overexposure. This is probably also one of the reasons why in our cameras we have an info page dedicated to highlights, but no info page for shadows. This could be also because the lighter areas of our photo are more sensitive to exposure changes than darker areas. For example if we change exposure time, aperture, or sensitivity for just one stop it will have a much stronger effect on highlights than it is on shadows. Changing exposure for just one third

of a stop will visually change highlights' luminosity while changes in shadows areas would be less noticeable.

This is why we need to control our lighter areas with more precision than our shadows. It is also easier to judge our exposure by highlights than by shadows.

Example

Let's return to our photo and observe which are the areas that our camera will tend to overexpose. It will be the sky and the top of the Colosseum. If we want to preserve details in those areas, we need to make them as bright as we can, but not to overexpose them to the level when we start to lose details (clipping point). That way we can capture as much detail from a scene as possible by using the dynamic range of our dSLR more effectively. Later in editing stage we will try to brighten darker areas. In other words we will **expose for whites and develop for blacks**.

Now let's switch the exposimeter in our dSLR to the matrix (evaluative) metering mode, measure the exposure without introducing any compensation, focus on the figure of the she-wolf and take a photo.

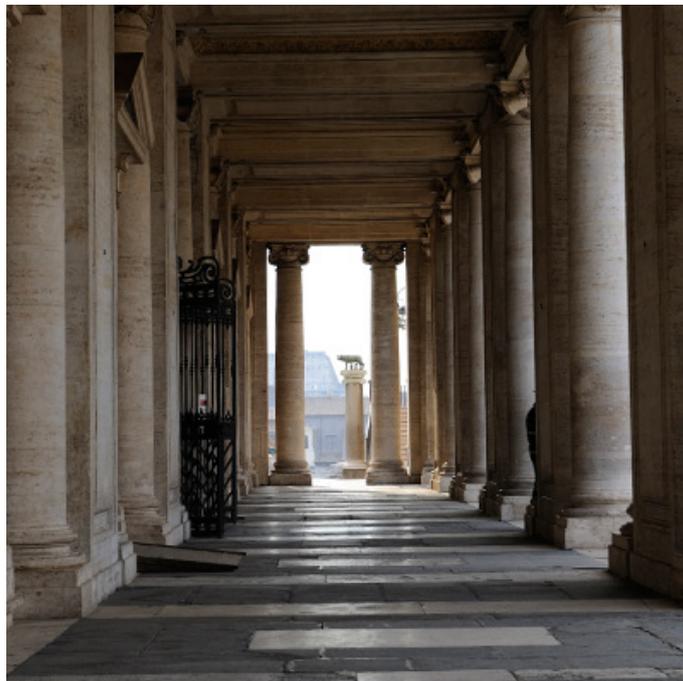


photo 2: Matrix (Evaluative) metering

You can see that parts of a sky were burned (clipped). This is because the largest part of our photo was in the shade and our exposimeter gave a slight priority to these areas, effectively overexposing parts of the sky as a less significant area (according to our exposimeter). If we wish to control the luminosity of a certain area, we need to switch our exposimeter into the spot metering mode and our camera into the manual mode. Now we can measure the sky separately and decide how bright it should be by manually changing exposure settings.

If we want our sky to become almost white, we need to overexpose this area for up to 2 stops. The exact amount will depend on the camera model and the settings inside of your dSLR like contrast, saturation, colour profile, etc. Now if you point your camera's spot metering circle at the sky and dial exposure in such a way that exposimeter shows we are overexposing this

area for up to 2 stops. For a precise reading the metering circle of your dSLR should see only the brightest area. If areas with darker details are entering the circle of measurement, you will need to reduce the amount of overexposure.

Now let's take a picture with our new settings and take a look at our highlights info page. You will see that nothing is blinking anymore. If you look at the histogram, you will see that the right most spike, representing luminosity of the sky, is located close to our highlight limit.

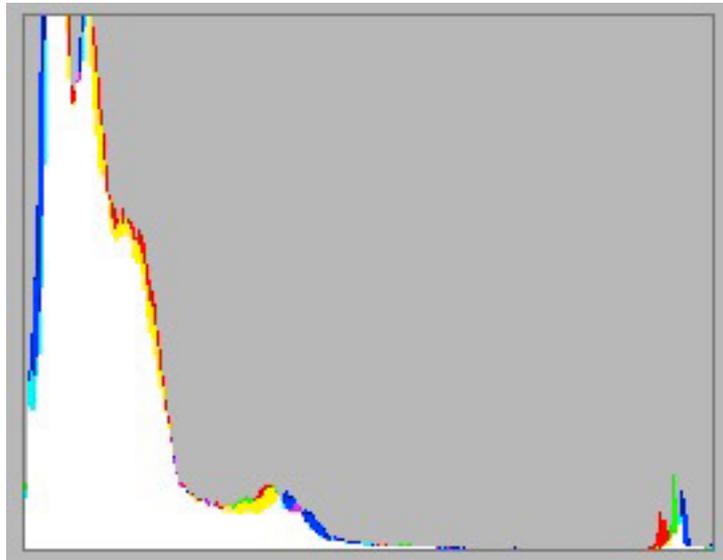


photo 3: histogram

Our goal is put this spike as far to the right as possible, but without it touching the border. This is a classical technique of finding a right exposure for the highlights. In digital capture this technique is sometimes called “expose to the right”.

In our example we found exposure settings that will produce the brightest part of our image as almost white, but not yet burned. You can see that the area under the columns now appear darker than we wanted it to appear in our final image. We can recover these areas in post production. If we need to skip the post production step altogether or if we are shooting directly into the JPEG format, we can use tools embedded into the internal software of our camera like D-Lighting. Remember that JPEG format will give us less latitude in post production.

Intentional overexposure

If the brightest parts of our image do not actually contain any details that we would like to preserve, we can intentionally overexpose those areas for more than one stop over the clipping point. I wouldn't advise to overexpose bright areas for more than two stops because the strong light from these areas will start to “bleed” into neighbouring areas distorting the borders and contours. Here is an example of what will happen with one, two, and three stops of overexposure over the clipping point.

If you don't find the clipping point of a bright area first, you'll never know for how much this area was overexposed and would not be able to control the level of overexposure.



photo 4: no overexposure



photo 5: 1 stop overexposure



photo 6: 2 stops overexposure



photo 7: 3 stops overexposure

If your dSLR have such a possibility, I would suggest to assign one of the programmable buttons to spot metering. This can greatly improve the speed in finding exposure for highlights as you will be able to go instantly to the spot metering mode. You can keep your camera in the matrix or evaluative mode and only when you would like to see whether you are overexposing some bright areas or not, press the button that was assigned to the spot metering and point your camera on those bright areas to see if they are brighter than plus two stops.

“...I don't like Manual mode...”

We were doing this exercise in manual mode, but you can achieve similar results in one of the auto modes like aperture priority or shutter priority by using exposure compensation feature of your dSLR. After you took a photo, look at the highlights and histogram info screens. If you notice that you were overexposing important bright areas, you would need to dial a minus compensation. If, on the contrary, you notice that the areas you wanted to appear brightly illuminated are too dark, you would need to dial a plus compensation until those areas appear as bright as you wanted them to be.

Conclusion

In conclusion, it is all about exposing your subject to the desirable level and controlling the global contrast of a scene.