Topic – 5 - Optics – Hyper Focal Distance

Learning Outcomes

In this lesson, we will look at what the hyper focal distance means and how it is important in relation to optics in digital photography. Knowing the hyperfocal distance for a given focal length and aperture can be challenging but we will go through this step by step so that you have a better understanding of this important concept.

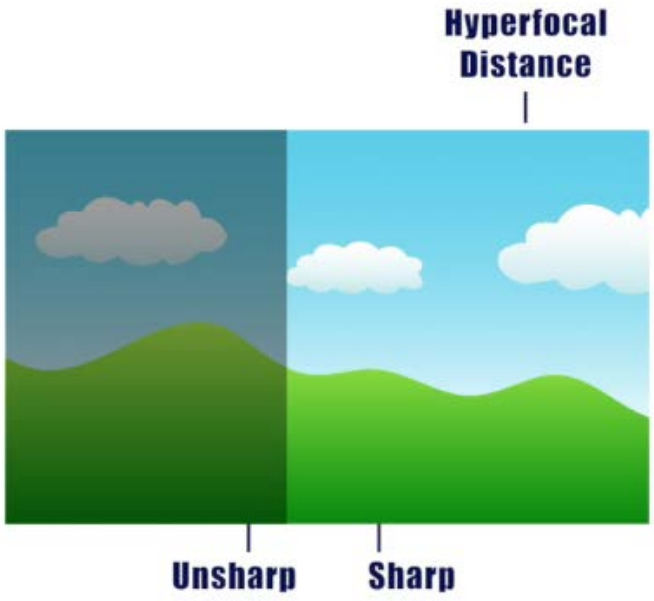
Advanced Photography

Hyperfocal Distance

Focusing your camera at the hyperfocal distance guarantees maximum sharpness from half of this distance all the way to infinity. This hyperfocal distance is very useful in landscape photography, because it allows you to make the best use of your depth of field. This produces a more detailed final image.

Where Do You Find This Hyperfocal Distance?

The hyperfocal distance is defined as the focus distance which places the furthest edge of a depth of field at infinity. If we were to focus any closer than this, even by the slightest amount, then a distant background will appear unacceptably soft or 'unsharp'. Alternatively, if one were to focus any farther than this, then the most distant portion of the depth of field would be out of focus. The best way to optimize your focusing distance is visually. Begin by first focusing on the most distant object within your scene, then manually adjust the focusing distance as close as possible while still retaining an acceptably sharp background. If your scene has distant objects near the horizon, then this focusing distance will closely approximate the hyper focal distance.



General Rule For Infinite Scenes

What if your scene does not extend all the way to the horizon, or excludes the foreground near you? Although the hyperfocal distance no longer applies, any scene still has an optimal, intermediate focusing distance. Many use a rule of thumb which states that you should focus roughly 1/3 of the way into your scene in order to achieve maximum sharpness throughout. While this is sometimes helpful, it is rarely optimal; the precise distance actually depends on many factors, including the subject's distance, aperture and focal length.

The problem with the hyperfocal distance is that a distant background is at the furthest edge of the depth of field, and is barely "acceptably sharp." This may lead to an undesirable loss of detail with images comprised primarily of distant objects, which can often be the case with landscape photography. Stubborn adherence to the hyperfocal distance often also neglects regions of an image where sharpness is critical. For example, a finely detailed foreground may demand more sharpness than a hazy background.

Alternatively, a naturally soft foreground can often afford to sacrifice some sharpness for the background. Some scenes work best with a very shallow depth of field such as portrait photographs, because this can separate foreground objects from an otherwise busy and distracting background.

The hyperfocal distance may not be appropriate for photos demanding quick judgement or with a limited depth of field. For example, sharpness with hand-held street photography is often less important than getting the shot. On the other hand, if we have sufficient light, manually setting a lens to the hyperfocal distance can avoid focusing errors, reduce shutter button delays, and make photography a virtually "point and shoot" process.

Practice

The hyperfocal distance is best suited when the subject matter extends far into the distance, and if no specific region requires more sharpness than others. Even so, it's often helpful to use a more demanding requirement for "acceptably sharp," or to focus slightly farther and improve background sharpness.

Also, try manual focus using the distance markers on your lens. Use as near a hyperfocal distance as necessary, but no closer. Using too high of an f-stop number can also be counterproductive as this can soften an image due to an effect called "diffraction" which is irrespective of the depth of field. Diffraction usually occurs when you have too much light during the day and you do not have an ND filter available.

What have we learned in this lesson? A Summary

We have learned about how the hyper focal distance plays an important role in photography and how it has a direct relationship with depth of field. Now that you are aware of what it is, you will begin to notice it at play when setting up your next photograph.