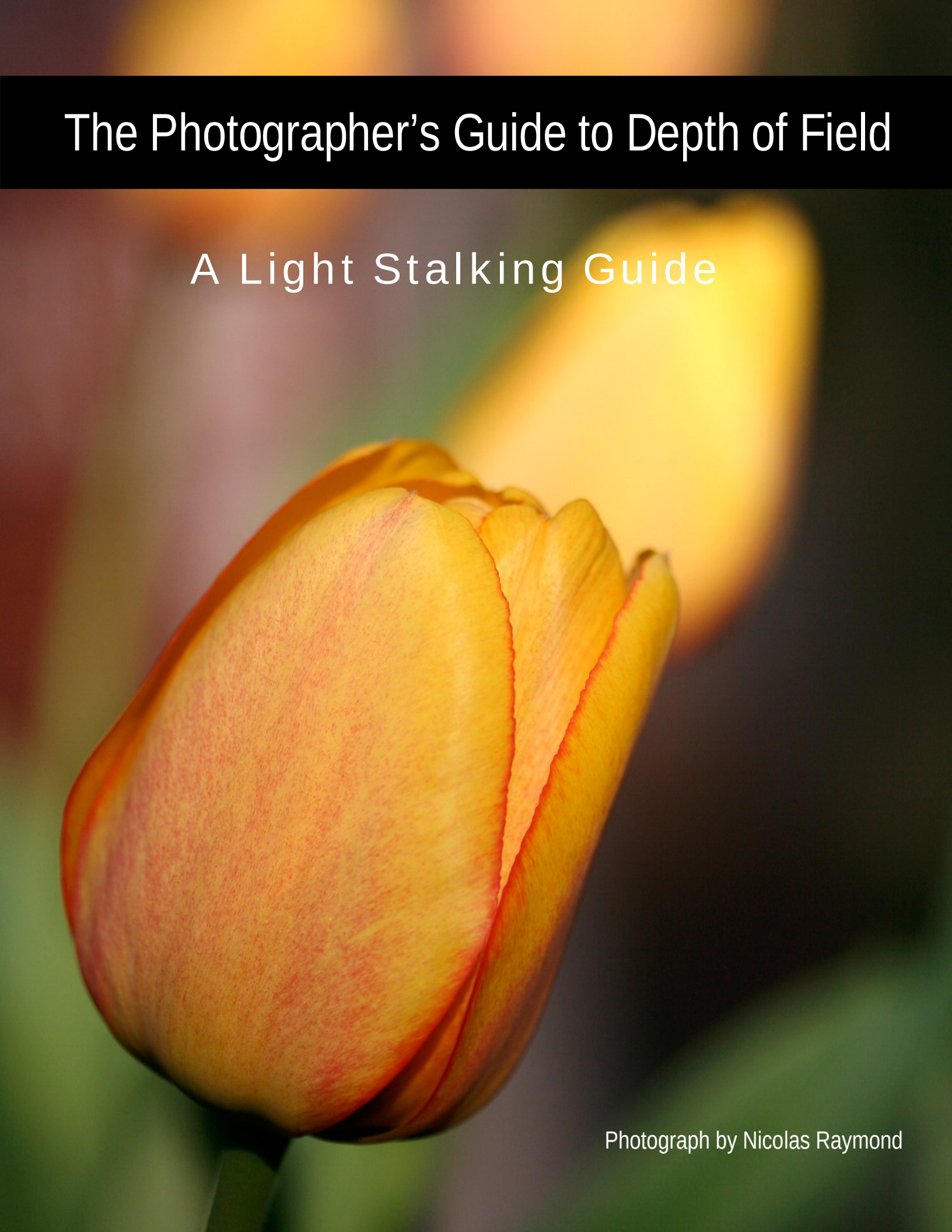
The Photographer's Guide to Depth of Field

A Light Stalking Guide



Photograph by Nicolas Raymond

What is Depth of Field?

Photography can be a simple form of art but at the core is a complex set of rules, mathematics and integral components that are used in the creating of any photos, on top of composition. This article is designed to be uncomplicated and explains what depth of field is and how you can use it to enhance your photography. At the core definition, depth of field is:

> *"the portion of a scene that appears acceptably sharp in the image. Although a lens can precisely focus at only one distance, the decrease in sharpness is gradual on each side of the focused distance, so that within the DOF, the unsharpness is imperceptible under normal viewing conditions."*

That's somewhat complicating to understand and just about every tutorial that I've ever read trying to explain depth of field refers to some math equations but essentially, depth of field is focusing on one specific element in your field of view and by adjusting the aperture setting on your lens determining what else will be in focus. If you want everything to be in focus you are aiming for deep focus, where as the foreground, background and everywhere else in the frame is all in focus and sharp.

The most common application for this is in an old photo term called *sunny 16*. The sunny 16 rule basically says if you're outside on a sunny day, set your camera to f/16, your shutter speed to 1/125th and shoot, your photos should all appear well exposed and be sharp *front to back*.

The opposite of deep focus is shallow focus, where you as the photographer select a portion of the frame while composing what you want to be in focus and by setting your lens aperture to *wide open*, a common term photographers use that refers to a lower f/ number on your lens, you create separation between the focused portion and the unfocused portion. The quality of this out of focus area, which is determined in part by the quality of lens, aperture setting, distance to the subject in focus from the camera and the distance from the subject to the "other" portions of the composed area, is commonly called bokeh by photographers.

Why Worry About Depth of Field?

Photo by Wili

If you're shooting a portrait outside like this one, and you shoot wide open, or with shallow focus, your subject becomes the focal point of the image. It's still plainly visible to see they are on a street, but the focus is on them, not the location. By shooting with shallow depth of field, a viewer's eye is instantly drawn to the blonde in the bottom right corner, as she is the focus.

So why is it important to know about depth of field and how do you go about implementing it into your photography? Shallow depth of field lets you draw the viewer's eye into specific parts of the image, creating a visible distance between subject and the rest of the otherwise flat, two-dimensional photograph. On the other side, using a large focus point will ensure that things like sunsets or group shots of people are sharp from corner to corner in your image. Implementing these two basic techniques of depth of field allows you to choose how the viewer of your photograph perceives everything and allows you to be creative with what is and isn't in focus.

Both the earlier linked wiki article and this one by Bernie feature the actual math calculations and illustrations that explain in great detail how depth of field is calculated, what the potential bokeh will look like and how to calculate things like the circle of confusion. This table and explanation is extremely helpful, but it's also very *confusing* in itself. They do illustrate what's actually happening, but more importantly, I can help share with you what they are actually talking about and why you may want to use them. For me, once I grasped how and why to use depth of field I stopped taking snapshots and started to create photographs.

Photo by DotBenjamin

Contrarily, yet using the same shallow depth of field technique, this photo shows the focus point on the foreground wheat while the man standing in the background is blurry and out of focus. This again shows some depth to the image and can create mystery and entice questions, like *who is the man?* Or *why is he standing there?*

In another example of shallow depth of field, this photo shows a woman, the only focal point of the photo, with what I'm guessing to be trees in the background. By choosing a shallow depth of field, the background becomes nothing more then a pretty canvas to display the foreground subject on. The intention of shooting this image wide open is to bring all the focus to the woman while using the natural environment as a clever background.

Photo by MaskedMalayan

Looking at deep depth of field, or narrow, you'll see in this crowd shot that everyone and all signs were intended to be read, so the photographer chose a narrow f/stop on their camera, probably f/16 or so. *Photo by David Chief*

In this stunning waterfall photo the entire scene is sharp and in focus. Utilizing shallow depth of field would not have made sense because no one part of the image is more important then the other. While another technique is used here – for long exposures – the depth of field concept is still the same.

In a photograph that could have gone in either direction, this image was shot at f/22 to keep both the child in the foreground in focus and the house in the background in focus. Had the photographer wanted to focus on just the child, a shallow depth of field and perhaps and aperture setting of f/5.6 would have been chose. Regardless, this is the choice of the photographer and the message wish to share, there is no right or wrong.

Photo by BigTallGuy

How to Apply Good DOF Principles to Your Photos

With some basic understanding of what depth of field is and some basic examples, implementation is the next step. In order to shoot photographs with a narrow depth of field a few factors come into play.

- Focal length of your lens
- Maximum aperture (lowest f/stop)
- Focal distance for your subject (if you're not using a prime lens)
- Distance between your in-focus subject and the out of focus section
- Digital sensor size
- Film size (for film shooters, 35mm, 120, 4x5, etc.)

All of these factors will essentially determine what you can and can't do in regards to *bokeh* or overall sharpness of the image from corner to corner.

So how can you apply these techniques? For the maximum depth of field when your goal is shallow depth of field you want the longest and fastest lens (lowest f/stop) and your subject to be as close to the lens as possible while the background is as far away as possible. This is why macro photographs of bugs look so amazing, but also what separates a portrait photograph from a snapshot.

Needless to say, you can't achieve a shallow depth of field by having someone lean up against a wall. This is also why portraits and fashion photography are generally shot on lenses in the 70-200 range and why the Nikon 85mm f/1.4 and Canon 85mm f/1.2 are among the most popular lenses in these niches. This is not to say you need to spend nearly $2,000 on a lens to get great depth of field, just know that you will get better results with better gear.

For deep depth of field, nearly any lens will work since the goal is everything in focus, however again, build quality and overall glass quality will help define a better, sharper image. It's also worth noting that most lenses have a *sweet spot* to them, that is to say, the larger the f/stop does not always equal a better, sharper photo from corner to corner. Most lenses are their sharpest one or two stops from the highest f/stop, however most lenses are their sharpest between f/16 and f/22.

What About Camera Presets?

With a little understanding, how can you best apply this technique? Simple. Regardless of which end of the depth of field spectrum you want to achieve the application is the same. Set your camera to aperture priority mode. In this mode you choose what aperture to shoot and the camera, through the internal light meter, will select the best shutter speed for you. It's not always full proof and sometimes you may need to use the EV compensation to over or under expose slightly, but more than nine out of ten times this will give you great results. Why not shoot in full manual mode? Because it might not always make the most sense, based on your particular shooting conditions.

When I shoot candid children photography of them outside playing at a park or in a field, they often run and play in both the sun and under the shade of trees. I'm more focused on running around to keep up with them and working on my composition, I don't want to focus on looking at what settings my camera is on. I set it into aperture priority mode and wide open (lower f/stop number) and never have to worry about exposure because the camera is doing it for me.

Likewise, when I'm taking group shots of friends or family or doing scenics or landscape photography, I'll set my camera again to aperture priority but at f/16 to ensure everything is nice and sharp and in focus.

Why don't I use the built in *Portrait* mode for my camera? Well to be honest, it sucks. Camera manufactures add these presets in an attempt to make shooting easier, but the reality is, some basic photography knowledge and knowing what you want the end result to be means you never need to rely on them, ever. Portrait mode in cameras is essentially setup for a wide depth of field (lower f/stop), that's it, no other magic! Why let the camera choose how much or how little shallow depth of field appears in your photos?

Depth of Field in Post-Production

I always suggest that you do as much in camera as possible because the end result is that much better, but what if you can't get the desired shallow depth of field in camera or you simply forgot or are editing older photos? Some advanced techniques in Photoshop, which require selectively blurring the background can bring you, close but they do require a lot of time and a steady hand to achieve. Editing photos this way isn't something you'd want to do to a lot of images, it's tedious work, but possible.
Another option would be to use a specific plug-in, like the Bokeh plug-in from Alien Skin. This Photoshop plug-in filter emulates the effects from more than a dozen popular lenses renowned for their bokeh and gives you full control after the fact. I've used this filter and really adore it, but again, it does take some time to use and can easily be abused to the point of photos looking fake.

Mastering and utilizing depth of field is both a basic and complex photography technique that is applicable to nearly every type and niche of photography. It will allow you to disregard those unflattering presets on your camera in favor of more control, ultimately ending in better photographs, not just snapshots. Get out there and play around with depth of field and see how amazing your photography can become!