

Sensor Sizes and DOF

by Michael Willems

One factor that affects depth of field is the sensor size. Simply put: the smaller the sensor, the more extended your depth of field in any given image.

This is an approximation and simplification but it is good for us as photographers.

Clearly, this means that if we want blurry backgrounds, we want large sensors. So what are the choices?

- ▶ Lower-end (and many higher-end!) point-and-shoot cameras usually have very small sensors. These do not make it easy to get blurry backgrounds!
- ▶ Then there are “almost-APS-C” sensors such as the “Micro four thirds” format – these are almost as big as a crop camera’s sensor. Micro four third cameras are twice as small as a negative. This is the trend in small cameras.
- ▶ The next step up is the APS-C crop sensor – 1.6 times smaller than a negative for Canon; 1.5 times for a Nikon. Most DSLRs have this size sensor. Some small cameras now also do (like my Fuji X100).
- ▶ Next, there is a Canon-only size that is 1.3 smaller than a negative – this is the 1D’s format.
- ▶ And finally, there is the full-frame sensor – it is exactly the size of a 35mm negative.

The bigger the better – also because a larger sensor gives you lower noise and hence higher ISO capability, and a larger, brighter viewfinder.

And this is why we are seeing today’s wonderful move to larger sensors. So my advice: when buying your new camera, do ask how large the sensor is, and go for the largest one you can afford.

Blurry Backgrounds

by Michael Willems

If I want a sharp foreground subject with a blurred background, there are several ways.

The reason this subject is confusing is that it is very complicated. “Sharp focus” and “depth of field” are subjects for mathematicians (check the Wikipedia entry, if you wish). Hyperfocal distance, lens geometry, approximations, cropping, aperture, magnification, f-numbers, image format size, sensor size – all these have an effect.

The main factors that affect DOF are:

- ▶ Sensor size
- ▶ Proximity to subject
- ▶ Zoom
- ▶ Aperture number
- ▶ The ratio of subject distance to focal length
- ▶ Cropping

Several of these factors are complicated and need not be taken into account all the time – but several can help you in practice. Chief among them: it is not just aperture that affects depth of field – it is also the distance to the subject.

In practice, this means that to get less depth of field (i.e. a blurrier background), you need to either:

- ▶ Select a lower f-number, or...
- ▶ You need to magnify more. And you can magnify more by zooming in, or by getting closer.
- ▶ A lower f-number in the same situation gives you more blur

So the lesson, I suppose, is that if you want blurred backgrounds but you cannot right now afford that full frame camera and the low f-number lenses that you should really invest in, at least get close.

Depth of Field

by Michael Willems

Depth of field is affected by aperture ... the lower the “F-number”, the more shallow the depth of field ... but also by lens length (the longer the lens, the more shallow the depth of field), and, importantly, by proximity. It is the relative distance difference that matters!