Dual Focus & Focus Stacking

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Sunset Cliffs & Flowers, San Diego Paul Roark, 3-2011

The above photo was taken, hand held, with a 24mm lens on a full frame digital camera. The image, when enlarged, demonstrates what taking 2 shots at different focus points and then merging them can do to extend depth of field and optimize sharpness. With a wide angle lens at a small aperture, a single frame will look quite good on a monitor, but a 16 x 20" print on the wall will not hold up to the standards of sharpness I like to achieve. This workflow, however, does take hand held, full frame digital camera images up to what medium format B&W photographers expect in their large display prints.

Slices from this 16 x 20”, 240 ppi image file at 100% are shown below.

Center at 100%

Top of flowers

Bottom edge

I have been making dual-focused images since I migrated to medium format rangefinder cameras from the Rollei SL66, and digital tools became available. The SL66 had a built-in tilt, which I found very useful in landscape photography. The dual focus workflow with the MF film cameras was a method of capturing the extended depth of focus and sharpness that the tilt had given to me. On a tripod, each method of achieving extended depth of field has its advantages and disadvantages. For hand holding and where the subjects of interest do not lie in a tilted plane, the dual focus approach works much better.

In the past a tripod was essential to get the quality I needed for the 16 x 20” or 22 x 28” prints that are my final product. Now that quality can be accomplished hand held.

A dual-focused, hand held 24mm on a full frame digital camera can record everything reasonably sharply from 1 m to infinity. For this the first shot has the focus set at the close point, with the infinity mark at the f/11 DOF mark. The DOF markings on lenses are suitable for snapshots only. For display prints I find about half of the f/11 DOF is useful with the lens set at f/11.

The second shot is taken with the focus ring set at infinity. This can be done easily and quickly without taking the camera from the eye, at least with a manual focus lens with an appropriate infinity stop. Thus the framing can be held quite close to the first shot. I prefer the distant shot to be at infinity because that results in the sharpest distant features, where the eye is most sensitive to softness. We expect some softness up close.

I do my merging of shots in PS CS5. Essentially Edit>Auto-Align Layers and Edit>Auto-Blend Layers provide the tools that make the blending reasonably easy.

To align the images they are both opened in PS. One is then copied onto the other. This makes the two images separate layers within one file. On the layers palette highlight both layers (control-click does it). Then go to Edit>Auto-Align Layers. When it is done you can see by making the top layer only partially opaque whether the details are aligned. The problems are usually where there is too much motion. Wind and a moving subject will probably always make some of the detail out of registration. So far, however, PS seems to do a rather good job of aligning the stable parts of the image.

After the images/layers are aligned, and Edit>Auto-Blend Layers function can select which layer has the sharpest detail, area by area. In fact, this process is less than perfect. I've found that a combination of the automated procedure and manual blending seems to make the best final images. The Auto-Blend benefits from some erasing of clearly out of focus parts on both layers prior to using the automated function.

After the automated Blending, further touch up can be done by pulling information from the 2 original images. To do this, copy the desired original image onto the blended one (or vice versa), make the blended layer the top layer, and erase it where the lower original later is sharper. Auto-Align and the Eraser tool make it rather easy. This can be done with each of the original images, one at a time, as needed.

Clearly it would be nice if the Auto-Blend did a better job, and the dedicated software packages may. However, the PS automation is still very useful, even if less than perfect.

Even when all the information from the original images has been utilized, there may be areas where neither image is sharp. This is where one's skill with the clone tool and retouching comes in.

Particularly where there is motion, shooting very quickly may help minimizing the extent to which touchup in PS is needed. To do this, the exposure is probably best optimized manually before the shot, and then auto-bracketing can be avoided. Then again, all of the examples here were 3-bracket shots, and they worked.

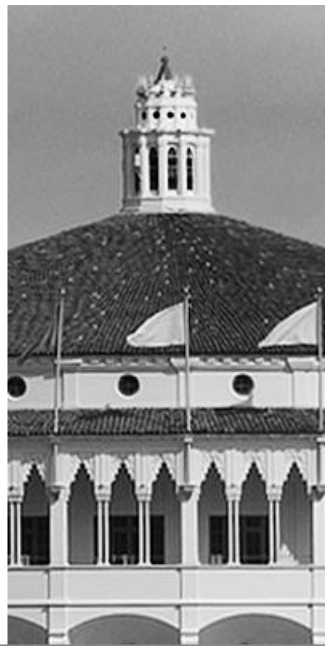
An early color draft of the above image, before any sharpening aside from the default sharpening of the raw conversion step in CS5, is shown here: http://www.paulroark.com/BW-Info/Sunset-Cliffs-Flowers-24-dual-focus.jpg

Some additional examples of dual focus shots are below.

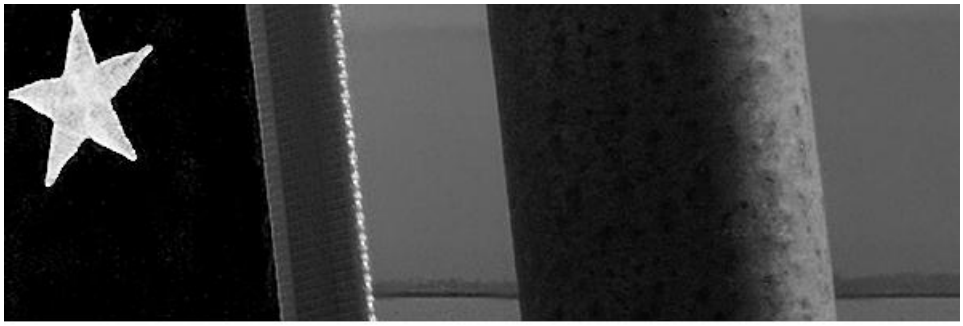
Pelican, Catalina Is., March 2011

The Pelican was a dual-focus shot with the 50 mm lens (full frame). The bird was cleaning itself and moving very quickly. That resulted in the need to retouch several edges due to movement. Still the final image worked, and with a degree of detail in the overall shot – foreground and background – that may be unique to this workflow.

Below are some close-ups of the above shot, displayed at 100% magnification. The image size is currently 16x24 @ 212 dpi.



Catamaran to Catalina



This sample dual focus shot was with a 24mm.

Paul

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