

FOCUS STACKING

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WHAT IS IT

Focus Stacking is a way to increase depth of field without increasing the f-stop or when that method fails.

There are disadvantages to increasing the f-stop to achieve the desired image:

- The necessary exposure time is increased
- Sharpness may be reduced due to diffraction
- The lens maximum f-stop may not be able to achieve the desired depth of field

HOW DOES IT WORK

This method takes multiple images of a subject focusing on a slightly different focal plane each time (focus bracketing). These are then combined via software to take the in-focus portion of each image to create a single image combining the best of each.

WHEN WOULD I USE IT?

Commonly, focus stacking is used with landscape and macro/close up images.

Landscape – Things to Consider:

- There are techniques to photograph a landscape with greater depth of field – increasing the f-stop, hyperfocal distance
- If there's a dominant foreground object and an interesting background, focus stacking may be most effective
- When using a telephoto lens which typically produces a shallower depth of field, focus stacking may be most effective.

Macro/Close Up – Things to Consider:

- Macro lenses have an inherently shallow depth of field
- Using a long lens has an inherently shallow depth of field

DISADVANTAGES OF FOCUS STACKING

- Can be time consuming
- Usually requires subject to be motionless
- May require a precision focusing device like a focusing rail
- Requires specialized software to blend images OR great patience and a knowledge of masking techniques in software that supports layers

LET'S DO IT

- Set camera up on a sturdy tripod or stable hard surface
- Frame and compose the shot – be aware that the merged image may be slightly cropped and space the composition accordingly
- Determine the exposure and then set the camera to manual mode to maintain it through all shots
- Via live view, set focus point to the closest object desired to be in focus

- Take the exposure
- Without moving the camera or changing settings, move the focal point slightly farther back
- Take exposure
- Repeat until the entire subject has been photographed
- For macro, it may take as few as 3 or 4 shots to as many as 30 or more
- For landscape, generally requires 3 shots – close, mid and distance focal points.
- Some newer cameras can take a series of focus bracketed shots, moving the focal point each time based on parameters set in the camera.

SETTINGS TO CONSIDER

- Focal length of your lens – the longer the lens, the more shallow the depth of field
- Distance to subject – the nearer to the subject, the shallower depth of field, particularly with macro lenses
- Aperture – the more the aperture is opened up, the shallower the depth of field
- Play around with settings to find the right combination for your project
- Try to keep the ISO low and the aperture at the “sweet spot” of the lens (f/8 – f/11 in most cases)
- Taking too few photos could result in a merged photo that has waves of sharp/unsharp sections; overlap the focal area from photo to photo
- Taking too many photos may mean that you can discard some of the images before you merge them or, if not discarded, the merge process may take a bit longer

FACTORS AFFECTING THE NUMBER OF PHOTOS

- Multiple subjects at varying distances from the lens, increase the number of photos
- Increasing the f-stop, reduce the number of photos
- The closer the lens is to the subject, increase the number of photos
- The longer the focal length of the lens, increase the number of photos

NOW WHAT DO I DO? THE MERGE

HELICON FOCUS

- Open Helicon Focus.
- Open images via **File>Open Images**. Browse to the folder with the images and select all of them. **Click Open**.
- Alternatively, images may also be opened **via Lightroom**: select images and then **File>Export>Helicon Focus**.
- In the right panel, select the **Rendering Method**.
- Click the **Render** button.
- When the merge is complete, select **File>Save**.
- Output is DNG or TIF. DNG is only available if the photos are opened directly in Helicon Focus.

PHOTOSHOP

- Open Photoshop
- Load each image on a separate layer: **File>Scripts>Load Files into Stack**. Click Browse and select all of the images. Click **Open**.
- Check the box for Attempts to **Automatically Align Source Images**
- **Click OK** and each of the mages will open into a new layer
- Alternatively, images may also be opened **via Lightroom**: select images and then **Photo>Edit In>Open as Layers in Photoshop**
- Open the Layer palette and **select All Layers**
- Under Edit, select **Auto-Blend Layers**
- Check the box for **Stack Images** and **Seamless Tones and Colors**. Optionally, select Content Aware Fill Transparent Areas which will fille any transparent areas generated by aligning images in step 3. This will increase processing time. The alternative is to crop the image after the merge.
- Click **OK**.
- Output is a PSD file.

ON1 PHOTO RAW

- Open On1 Photo RAW.
- **Browse** to the folder containing the images.
- **Select all** of the images.
- Click on the **Focus icon** on the right side of the screen.
- Several options are offered along the bottom of the window. Select **Align Photos** and optionally, select the module to **Open In** – Develop, Effects or Browse.
- Click **Save**.
- Output is a proprietary file format but can be exported in a variety of formats: JPG, PSD, TIF, etc.

FOCUS STACKING SOFTWARE

- Helicon Focus – on year license \$30 or \$55, lifetime license \$115, \$200, or \$240
- Photoshop – photography plan \$9.99/month or \$119.88/year
- Zerene Stacker – \$89, \$189 or \$289
- On1 Photo RAW – \$100/year or \$130/year
- TuFuse – ???
- CombineZM – freeware
- Picolay – freeware?