

Panoramas

Expanding the Capability of Your Camera

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With Input from Frank Richards

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Expand the Capability of Your Camera

- Our camera sensors are very good and getting smarter with every new release and we have a wide variety of lenses available to us.
- But there are limitations due to physics or the state of the technology or which lens we have with us at the moment.
- By taking multiple images while varying just one parameter and then combining these with special software in post-processing, we can increase the capability of our camera and lenses.
- We have explored two of these and will address the third tonight.

Expand the Capability of Your Camera and Lens

- ✓ Focus Stacking – Expand Depth of Field
 - Use when don't have DOF to capture entire image
 - Combine images taken at different focal distances to increase depth of field
 - In-camera image sequence capture common in latest generation of cameras
 - Few cameras have in-camera stacking and RAW output
- ✓ High Dynamic Range (HDR) – Expand Dynamic Range
 - Use when dynamic range of scene exceeds camera dynamic range of the sensor
 - Combine images with different exposures to increase dynamic range
 - Some in-camera capabilities with jpg output
 - Auto exposure bracketing helps take source images
- Panoramas – Expand Field of View
 - Use when want wider image than your widest wide-angle lens can capture or higher resolution than can obtain with single image
 - Stitch together adjacent images to expand the field of view
 - Some in-camera capabilities with jpg output
- HDR Panorama – Expand Dynamic Range and Field of View
 - Combines HDR and Panorama
 - Must shoot HDR sequence at each Pano position for source images

What Is A Panorama and How Is It Helpful

- Panorama –Comes from Greek *pan + horama* which translates to *all + view*
- Panoramas can tell a more complex story and draw the viewer closer to the feeling of what it was like to be there.
- Panoramas are typically horizontal, but can be vertical or even a grid.
- Panoramas can increase resolution and detail.
- Panorama image is generally defined as having an aspect ratio greater than 2:1
 - Around 3:1 aspect ratio is thought of as classical standard
 - Greater than 3:1 is certainly a panoramic image, but it is a little cumbersome to view and display and hard to sell. Doesn't present well in digital format
 - Can buy standard sheet paper and frames for 2:1 and 3:1 images
 - [13x38 Photo Paper \(redrivercatalog.com\)](http://redrivercatalog.com)
 - Note that some printers have a limit on length of a print.

Ghost Ranch

8 X 48 Inches (1:6)

2825 X 16045 = 45MP from 12MP Nikon D2X



Crop to Make a Panorama



Cedar Breaks

3:1 crop

6402 X 2134 = 13.6MP

Nikon D800 36MP

Would Make a 7 X 21 Inch Print

Other Examples of Cropped Panos

Can Expect Very Good Results with Higher Resolution Cameras



Mono Lake

2:1



06 Ranch

2.5:1

Use Your Cell Phone to Make a Pano



Single iPhone Photo with Pano Function



Combined iPhone Photos



Single iPhone Photo with Pano Function

Take Multiple, Overlapping Images



Four images at 130mm
Combine with Software and Process



Best Practices for Photographing Panoramas

- Tripod with a head that can swivel.
- Level the camera. Do not point up or down.
- Try to have the subject in the middle of the frame.
- Specialty gear is available, but I haven't used mine in 10 – 15 years.
- Manual exposure. Fixed white balance (e.g. Daylight).
- Overlap one image to the next by 30% to 50%. I am often at 60-70% overlap
- If handholding work at holding the camera level.
- I shoot left to right but that is not necessary.
- Shoot a marker slide before the first shot and after the last shot.



Grand Canyon



Death Valley
Artist Point



Caddo Lake

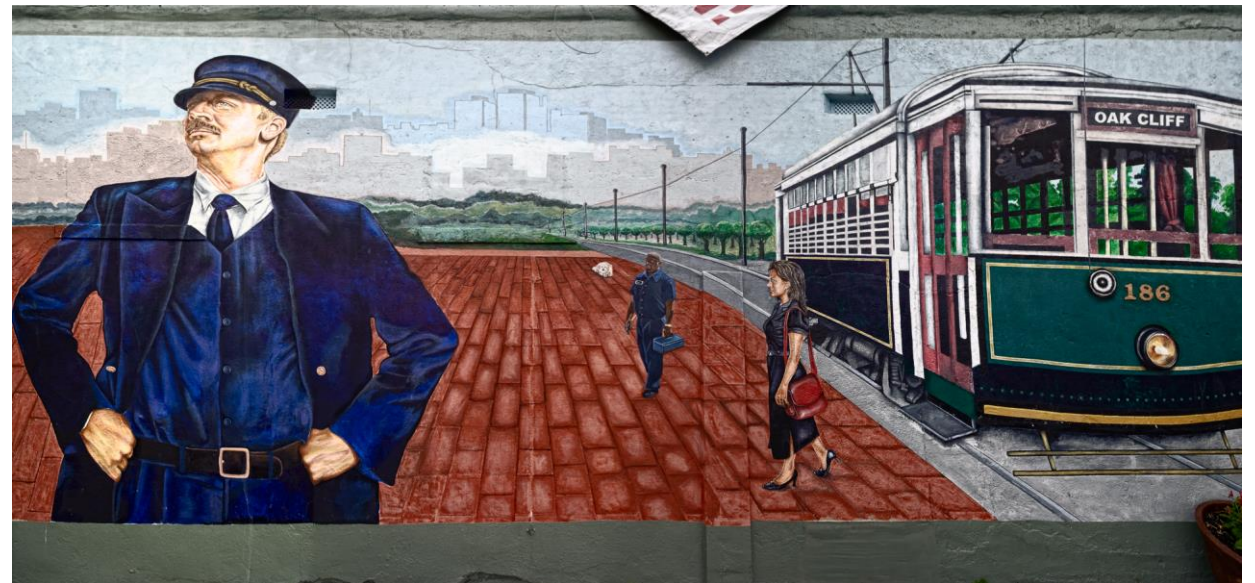
Alternate Approach

- Requires a tilt/shift lens.
- Level on a tripod.
- Shift to left and shoot.
- Shift to right and shoot.
- Will be perfectly aligned.



A Specialty Approach

- This works in some cases but can have issues.
- In these cases, there were cars along the sidewalk, and I couldn't get a good position.
- Rather than rotating the camera, take a shot, walk parallel to the object and shoot again, repeat.

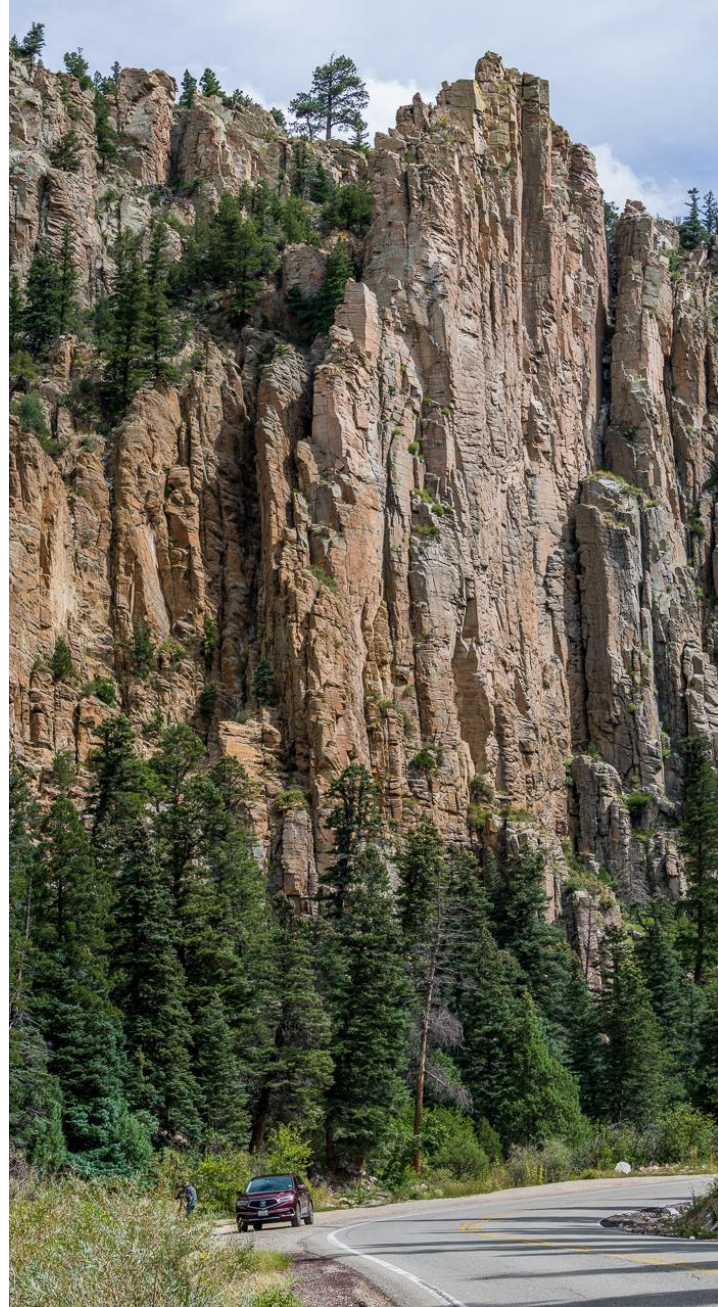
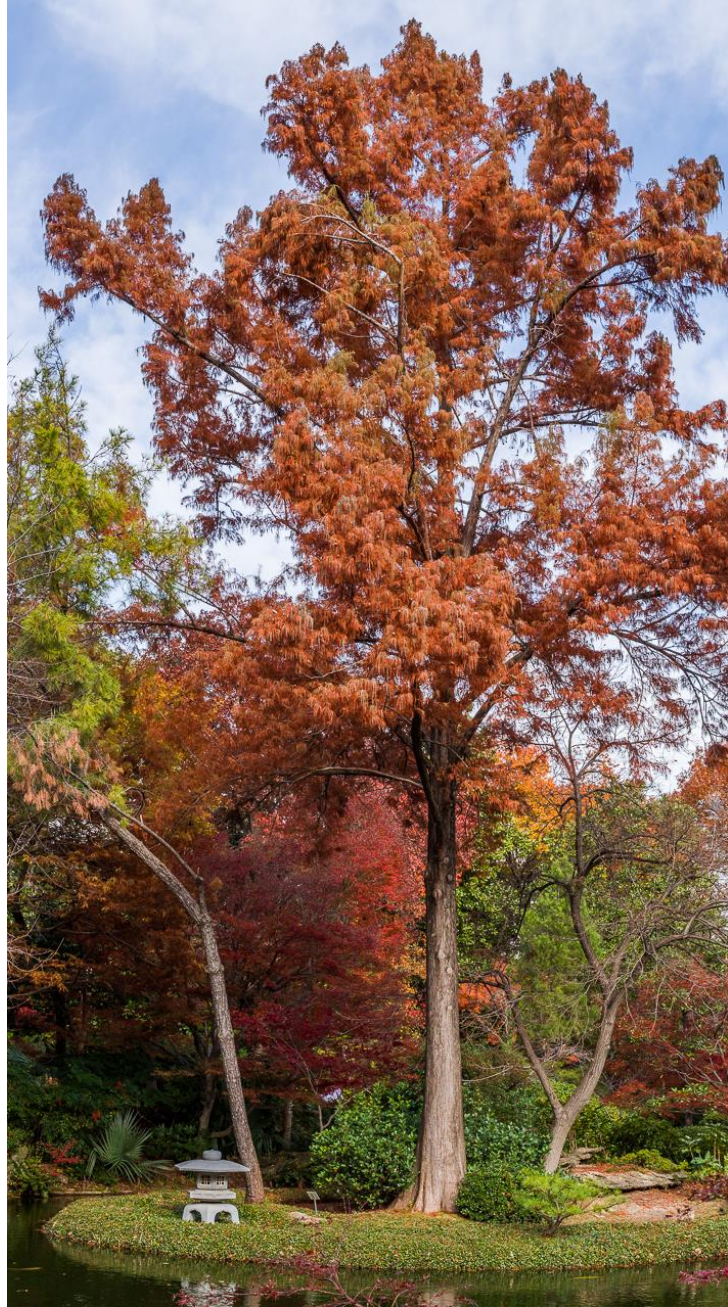
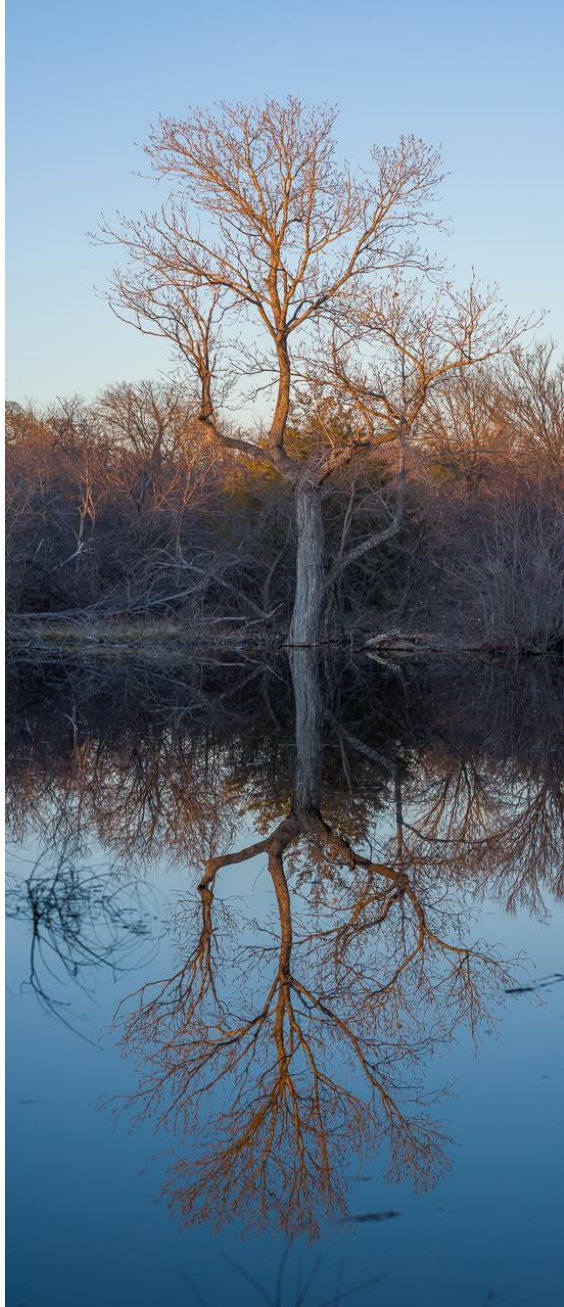


Vertical Stitching

- I don't think verticals are strictly *panoramas*, but vertically stitched images are useful and can be dramatic.
- Works best if you are at a great distance so that parallax is not such a significant problem.
- 7 Shots at 300mm about a mile away.

Where was I?





Stitch in a Grid

- There are times you might find yourself without a wide lens.
- You can take multiple row of images and stitch them to cover a wider field of view.
- 52mm (equivalent)
- Two rows one with 7 shots and one with 6





12 shots = 2 x 6
100mm



4 shots = 2 x 2
50mm

References

Expanding the Capability of Your Camera - Frank Richards

Part 1 - Panoramas [PDF](#)

Part 2 - HDR (High Dynamic Range) [PDF](#)

Part 3 - Focus Stacking (Expand Depth of Field) [PDF](#)

Demos