

Basic Principals of Stereo Photography, using a single camera

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Why take just one picture when you can easily make a stereo pair? Expand your photographic repertoire into the world of stereo imaging.

A stereo pair consists of two pictures, one for the left eye and one for the right. Even though the two pictures may look very similar, they're not identical. During viewing, the left eye sees the left image and the right eye the right; then the brain fuses the two so you perceive depth.

It's easy to take two pictures with one camera, but you can also use a special 3D camera (there are numerous available today; mostly twinned cameras, but a few single cameras with two lenses). There are several things you can do with a single camera that you can't do with a 3d camera, and vice versa. With a single camera, you're not limited by the spacing between shots, and you can use whatever lens and body you prefer. With stereo cameras, you are stuck with the sensor and lens the manufacturer decides. On the other hand, a stereo camera will allow you to take photos of moving subjects, such as running water and action shots of people and animals. Even clouds move enough to notice, and shadows too. For these reasons, stereo cameras are great choices for general subjects, closer landscape scenes and people.

But with a single camera, you can control everything about the very camera you use, so if you like to do closeups, or distant landscapes, or work with studio lighting, or you like to be spontaneous and not burdened with lots of gear, then a single camera is for you.

Keep it Level. Keep the camera horizontal, and facing forward (do not toe in), or else aligning the images later will be harder. When you frame your subject, make a note of objects and edges near the top and bottom borders and use that as a guide.

Lens spacing. For a normal scene within say, voice range, shift the camera by about 2.5 inches between shots (the approximate spacing of the eyes). The easiest way to do this is to shift your weight from one leg to the other, with your feet in a normal standing position.

You will need different spacings for subjects very far away and very close up. For distant shots, like a view from the top of the Empire State Building, you may move several feet (just keep foreground objects out of the frame). If you are in an airplane, shoot clouds with a few seconds between shots, and the land below a little more, maybe 4 or 5 seconds. The plane will take care of the half mile or so between shots. For very close up subjects, just move your torso and inch or so and judge the difference between the near and far parts of your image.

The idea is to think in terms of the angle formed by the two camera positions and the subject. Try to imagine the relationship between your two eyes and the subject as a printed piece. If a mountain is the subject and you are in an airplane, imagine the print of the mountain and how your two eyes relate to that print. Now visualize a life sized mountain, and how far apart your eyes will have to be to replicate the scene as printed on paper. You would be like a giant. The reverse is

true of macro work. Now you are a Barbie doll.

Viewing the images. Now that you have taken your two pictures, you'll want to preview them (without any special 3d viewer) on your LCD screen to check your progress. This is called freeviewing. You can either view parallel or cross, meaning diverging your eyes toward the parallel, or crossing your eyes slightly. If you remember the random dot stereograms published as Magic Eye books, then you're familiar with the parallel technique. In parallel, the left image is on the left. Basically, you relax your eyes (don't try to focus on anything) so they drift apart. You'll see multiple images emerge as each eye sees the pair independently. Concentrate now on seeing three images, where the middle one is a perfect overlap of the right and left, which will appear in 3D when it pops into alignment.

Some people find it easier to view in cross-eyed fashion. With the images reversed (the right image is on the left and the left is on the right), cross your eyes slightly until you see multiple images overlapping and stop when they become three images, the middle one being the stereo composite. Or, putting your finger halfway between the images and your eyes, and focusing on your finger, will naturally pull your eyes into the right position. Then move your finger away and refocus on the center stereo image.

Once you have learned to do this, you'll be able to preview the pairs (in grid view) you take on your digital camera and gauge whether there's enough depth or not.

Subject matter. Sometimes a scene is all wrong for flat photography, but is ideal for stereo. A subject with a busy, in-focus background generally does not make a decent photograph. But if the busy background complements the subject some way, the depth can work in your favor by creating separation. Or sometimes a subject is wonderful to behold in real life, but a photo disappoints. With stereo, you can capture the interplay of the layering that made it interesting in the first place.

And then some. This should be enough to get you started, but there are many other ways to take stereo images, such as mounting your camera on a slide bar, syncing two cameras together, having two people press the shutters on two cameras simultaneously (often used with landscapes where the cameras are several yards apart), and using 3D modeling software and taking your 'shots' from two different positions.

Displaying and viewing the images come in various flavors also. Slides in viewers, images projected on a screen, stereo cards in a viewer, anaglyph prints with red/cyan glasses, ViewMaster reels, and large format prints meant to be cross-viewed (there's a limit to how far you can parallel view, but most people can crossview larger pairs). Then there's the special anaglyph format called a phantogram which makes your image appear truly lifelike.