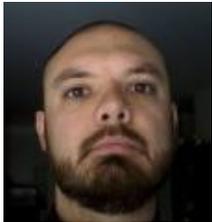


Feature



Costume Photography In 3D **Blake Barrett**

An avid photographer and inventor shows how to produce amazing images by making a simple digital stereo camera and photographing costumes in 3D.

Conventions are great places for people-watching. So many people are in costume that it's like visiting a place that exists only in fantasy. It's definitely something to record, so you can relive the experience as you remember it.

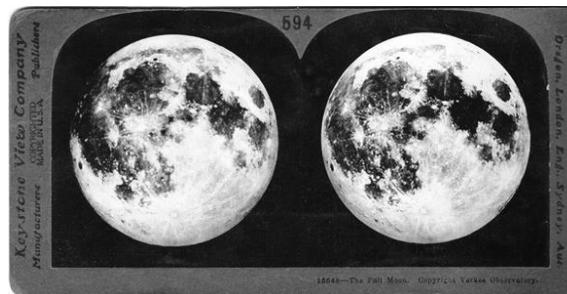
I recently attended the 2010 [Nova Albion Steampunk Exhibition](#) in Emeryville, California. As an amateur photographer I always bring at least one camera, but recently I have started dabbling in 3D photography with a simple stereo camera I made myself. This was the first time I used my setup to photograph people in costume.

The response I got at the convention was very positive. Everyone I photographed was interested in my camera setup. Some people even approached me to have their pictures taken. The idea of digital stereo photography seems like a perfect fit in the Steampunk world – a modern incarnation of what is essentially Victorian technology.

While it may seem like a modern technology that is growing in popularity, 3D photography, or *stereography*, dates back to the late 1830's, when Sir Charles Wheatstone presented his explanation on how binocular vision works to London's Royal Society and made the first stereoscope from a collection of lenses and mirrors.

A *stereogram* is nothing more than two images taken at nearly the same time along a parallel plane. The optimal distance between the two cameras lenses is two and a half inches, the average offset of human eyes.

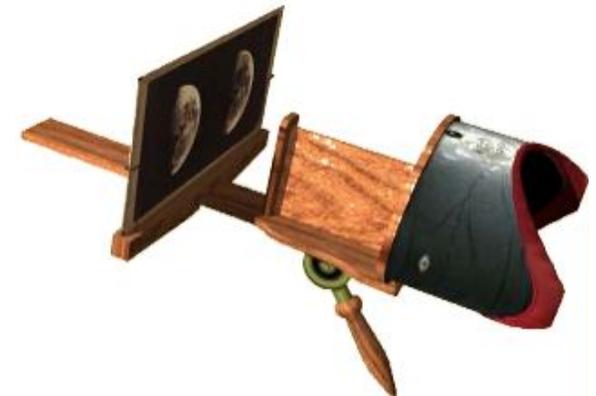
Since our vision is binocular, or stereo, it only makes sense that in our attempts to capture and record our perceptions of the world, images taken should be in stereo. This makes as much sense now, as it did in the Victorian era when cameras first debuted and photographs were more easily available.



Full Moon. Keystone View Company 1915

The [New York Public Library](#) has an extensive collections of stereo views dating back to the nineteenth century. Stereoscopes

are what people used to view stereograms printed on cards. Stereoscopes ranged from fancy cabinets with view ports in them, to small hand held viewers.



Oliver Wendell Holmes style stereoscope c. 1910 .
Photo by Christopher Fluke

In 1939, one company started making a viewer that used a new format of stereo cards. Originally purposed for sale in gift-shops at scenic tourist sites and for use as post cards, these multiple image stereo cards were a hit and the View-Master was born.

Like many people, the View-Master was my introduction into the world of *stereography*. I remember as a child looking through old View-Master reels at my



grandparent's house, wondering how it worked and why regular pictures didn't have the same effect. I remember trying to squish the film, thinking that it was some kind of shallow transparent shadow-box.

As I got older, I was still fascinated by the 3D effect produced by such a primitive device; it was a form of virtual reality before computers. Had I known that taking stereograms was so easy, I would have started sooner.

Stereography and costumes are a perfect combination. The dramatic effect of a costume that you see in person is often lost with standard photography. Stereography captures more detail. It allows you to see how fabric folds and drapes. It's especially good for Steampunk because it lets you see how all those nifty props and accessories actually look in real life. Once you've tried stereography, you many never go back to flat 2D photography again.

There are two parts to stereography: how you take a stereogram, and how you view it. I'll show you several ways to take them, and then talk about different ways to process and view stereograms like the one on this page.

Making Stereograms

The most basic method of stereography is the "side-step" method. This involves taking two images of the same subject by slightly leaning your weight on your left leg, lining up and taking your shot, then shifting your weight slightly to your right leg and re-



Dirigible Airship Crew.. Stereogram by Blake Barrett at Nova Albion

shooting from your new position. You will be limited to landscapes, still-life and some portraits, but with practice, you'll get roughly the correct separation to produce a stereo effect. This is useful for post-masquerade portraits or when the costumer is posing. Some of my best stereograms were taken using the side-step method.

Keep in mind that, the greater the distance between the images, the more exaggerated the perception of depth. If you shoot a pair with a five inch distance, you will see the world the way a giant twice your size would see it. This trick makes small things seem bigger and brings large things down to size. That's how aerial GIS surveys work along with stereo microscopes. The

former turns mountains into molehills while the latter makes the microscopic life size.

Another way to make a stereogram is to use a specialized camera that records two images a once.



View Master Stereo Camera 1952

This is much better suited to hall costume photography, where people and things are moving.

Early stereo photographers often used these kinds of cameras to shoot stereograms.

The [Holga 3D Camera](#) and the [Fuji FinePix W1](#) are two modern examples. The

Holga is a medium-format film camera that uses two lenses and shutters to expose two distinct negatives at once; while the Fuji is a digital camera that also has two lenses but sports two 10 megapixel sensors and is also capable of recording 3D video. Sharp is also readying a low cost, integrated 720p 3D digital camera module for consumer devices like digital cameras, webcams and smart phones in late 2010.

If you don't feel like spending \$1000 on a new 3D digital camera, Chinese camera



accessory maker [Loreo](#) makes a two-into-one lens that mounts on your SLR body for less than \$200. It has two lenses that projects two images on one negative, split down the middle.

You can also make your own DIY stereo photo rig. You need two cameras with similar lenses, or that can at least zoom to the same focal distance. Many inexpensive digital cameras are available. Smaller ones make it easier to get the correct separation.

You will also need a piece of flat drilled steel – the kind that you buy at any local hardware store, two 1/4-20 bolts that thread into the tripod mounts of your cameras, and a two lock washers. I prefer Allen head bolts because you can more easily tighten them with your fingers



Put the lock washers on the bolts and then run the bolts through the steel. Thread them into the tripod mounts on the cameras, and hand-tighten.



This type of setup is what I used at Nova Albion. It works best when the cameras have easily accessible shutter.



Blake Barrett at Nova Albion. Photo by Kathe Gust.

mechanisms because you'll need to activate them both while still holding the rig.

A variation that may be better for costume stereography is to include two 90-degree bends in the bar and mount both cameras in portrait mode. You can also mount the entire rig on a tripod if you're doing more formal portrait stereography.

Viewing Stereograms

There are a few ways to take stereographic images; there are even more ways to process and view them. Each of them have their benefits and drawbacks.

Victorian Era stereograms were printed on 3½" x7" cards as stereo-pairs and viewed with stereoscopes. That method worked back then and still works now. Holga, the company that makes one of the above mentioned stereo-cameras also makes a modern stereoscope. Loreo also sells a



[cardboard viewer](#) for under \$2. Neither work for displaying the images to more than one viewer.

Another option is converting images into Red/Cyan *anaglyphs*. Anaglyphic stereograms were popular in the 1950s. Large groups of people could view the same image(s) using color blocking glasses. Science fiction movies were shot in stereo and presented in anaglyphic 3D.

My favorite method is free-viewing parallel stereograms. With the left and right

images side-by-side, “look through” them, relaxing your eyes until the two images merge into three; the center one is in 3D. It requires no equipment, and allows you to focus on different areas and depths of the image with full color fidelity. Not everyone can do it, Some find that holding a length of cardboard edgewise between the two images helps, while they're learning to do it, by blocking the opposite image from each eye. .

A related technique called *cross-eyed viewing* is also common, where you cross your eyes and look at the two images with opposite eyes. Some people prefer this.

You can also view stereograms as *wigglegrams*, animations that flips quickly between two images. It is not a true 3D because both eyes see the same image at the same time; stereopsis occurs in the brain. It is the only form for single-eyed viewers.

Most of these techniques can be done in Photoshop, iPhoto, or Gimp. An application called [Stereo Data Maker](#), developed by a fellow stereogram enthusiast in Japan, is a full-featured stand-alone application that runs on Microsoft Windows.

I wrote a small application called [Stereogram Studio](#) for lining up and scaling images, then saving both parallel and cross-eyed stereo pairs; anaglyphs and wigglegrams are on the future features list. It is the only such application that works under Windows, Mac OS X, and Linux. I also wrote a web-only version of my alternate frame sequencer, called [Flipper](#). Links and instructions are on my [stereography blog](#).



Adventure Girls. Stereogram by Blake Barrett at Nova Albion

Tips for Better Stereograms

To achieve a good sense of depth and add some “pop” to your images, have the subject(s) stand in such a way that there are at least two focal planes. One of my favorite stereograms is of the two adventure girls (above), standing both at $\frac{3}{4}$ turn leaning forward with their arms in front.

There are six planes of convergence:

1. front arm of girl on right
2. head and upper body of girl on right and front arm of girl on left
3. head and upper body girl on left, and lower body of girl on right
4. back leg of girl on left
5. people at table behind girls
6. background

The Future

3D TVs and computer displays that do not need special glasses will soon be here, and what I've just described may be replaced by new technology and software, the best of all possible worlds. Their arrival will usher in a new age of consumer stereography, and the promise of ubiquitous 3D costume photography at conventions and masquerades. It may even let me view that stereo movie that I took at Nova Albion.

Blake Barrett is like a modern-day superhero. By day, mild mannered software engineer, by night (and weekend) amateur photographer. His wish to get just one shot published somewhere has finally come true, so he can stop holding his breath. Visit his [web site](#) to learn about his many interests.



Military Girl. Stereogram by Blake Barrett at Nova Albion



Professor Westinmore's Backpack. Stereogram by Blake Barrett at Nova Albion



Sky Girl. Stereogram by Blake Barrett at Nova Albion



Vagon. Stereogram by Blake Barrett at Nova Albion