

Creating 3D Stereo Chromatic Anaglyphs

Using a digital camera and Photoshop

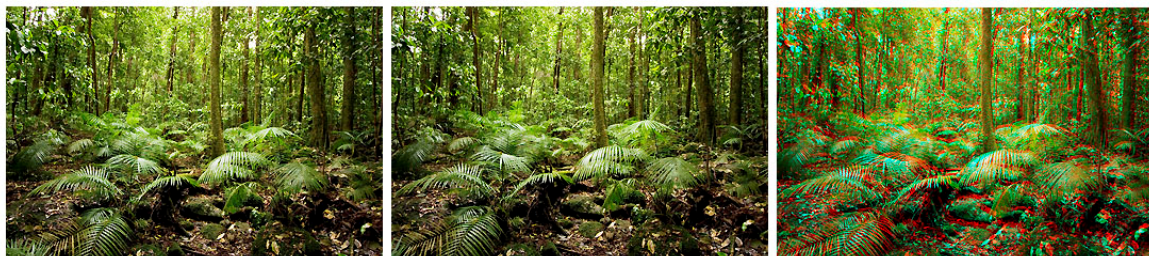
an article by David Summerhayes ©

The use of stereo photography. Stereo photography has been around since the end of the 19thC. Its popularity has waxed and waned as the processes of photography have developed and as fashion and circumstance has dictated. It is not as popular at the moment as there are so many other ways for realism to be represented in an image. Our world is becoming over saturated with images, DVDs and colour wherever we look. I think most people would associate 3D images with the curious twin B&W cards sometimes found in curiosity shops or big budget I-Max movies. Still 3D images are not being made so much now, due to the specialized cameras and/or photographic techniques needed to produce them as well as the awkwardness of the equipment generally associated with viewing them. Keeping track of stereo pairs, aligning twin projectors or the expense of setting up an interlaced video system are just some of the problems that may be encountered. However, they can be fun to make and view and as well as being a curiosity, can teach the viewer about how human binocular vision really works. One way to simplify the viewing of a stereo image is to create a chromatic anaglyph – a single image for simple viewing.



Examples of turn of the century 3D viewing cards from Egypt

What is a Chromatic Anaglyph? Anaglyphs are still or moving pictures usually made up from a stereo image pair where the red and green/blue channels have each been extracted from the left and right images of the stereo pair, then reassembled so the resulting image appears three-dimensional when viewed through 3D anaglyph glasses. Since all of the information is contained in one print or file, the need for registering a stereo pair before viewing is negated making this a quick and easy method to use. All that is needed is a pair of red/cyan glasses. Images may be printed out as handouts, displayed as posters or viewed on a video projector or monitor.



left view

right view

resulting colour anaglyph

Creating a pair of stereo images. Image pairs can be made by simply taking one photograph, moving the camera horizontally, and then taking another. This can be done using only one camera but to capture moving objects, two cameras fired simultaneously are required. Using a tripod is not essential but it is important that the images are as similarly framed as possible. Subjects with definite foreground, middle and background elements work best. The images should have good depth of field.

During stereoscopic viewing, the brain must not only focus, but must also blend or fuse the two images on the retinas into a spatial image. This can cause headaches if the pictures are out-of-focus or have a shallow depth of field, as the sharp lines which are needed to focus upon are not apparent. It is best to choose subjects of fairly bland colour but having a nice range of tones as they will be split into equal parts of red and cyan later for viewing. High contrasts of black and white will not 'split' into different channels; therefore a good tonal range is recommended.

I recommend the habit of always taking the left image first. This makes sorting out the images much easier. After downloading it is best to put all of the left images into one folder and the right ones into another.

How far should I move between images? The easy answer is about the distance between your eyes (8cm) to simulate normal vision but sometimes this is not a large enough stereo base to get a dramatic effect. For distant landscapes a greater move is needed (30-60cm or more) and for close ups just 2-3cm will suffice. A rule of thumb for the math wiz kids out there is about one thirtieth of the distance from the camera to the nearest important object. An easy way of making a pair of images, if you are not using a tripod and you don't want to do the maths, is to stand with feet about hip width apart, have your weight on your left foot while you take the first shot then transfer your weight to the right foot to take the second shot. Find a single distant point in the subject and keep it in the same location in the viewfinder so that you are photographing the same subject area in both images.

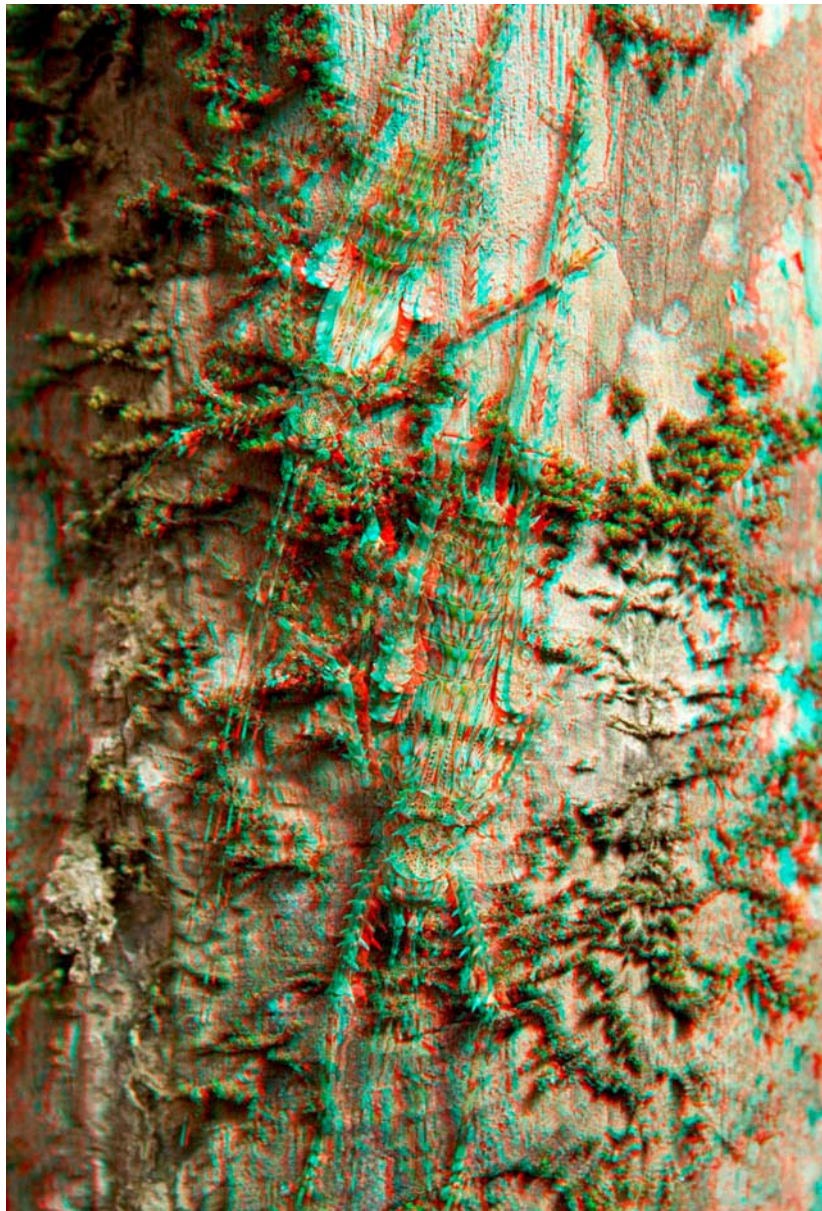
Working in Photoshop. This is the tricky part to get your head around but it is easy to do. Keep in your mind that when viewing the final image the red filter will be placed over your left eye and a cyan filter over your right eye. These filters are used to separate the single anaglyph image which you produce – information from the left image will go to your left eye and information from the right image will go to your right eye.

You now have to take the left hand image red channel, which will be seen only with the left eye and place it into the right hand image red channel, which is no longer needed. The blue and green channels in the right hand image will make up the cyan proportion of the image and this will be the final image for viewing.

Open a pair of left and right images. Holding down the shift key, with the move tool selected, drag the right image onto the left, thus creating a new layer. Re-name this layer Right and re-name the background layer Left. At this stage you may like to save the stereo pair as a .psd file for later reference. (If you want to 'fine tune' the image (next step) now is the time to do it before moving on).

With the left layer active, select the channels palate then click the red channel to make it the only active channel (Ctrl/Cmd+1). Select all (Ctrl/Cmd+a). Copy to the clipboard (Ctrl/Cmd+c). Now make the Right layer active and select the red channel of this layer (Ctrl/Cmd+1). Select all (Ctrl/Cmd+a) and paste the red channel that has been saved to the clipboard (Ctrl/Cmd+v). Make all channels active again (Ctrl/Cmd+~) and return to the layers palate. These steps can be recorded and saved as an action which will make life easier if you are going to do this often. The resulting image should now have some red/cyan halos. At this point you may like to put your red/cyan anaglyph viewing glasses on and see how it looks. If it looks good, flatten the image, size to your liking and save a copy as a .jpg. If it's 'kinda funny lookin' you may have the left and right images reversed. Don't be disheartened, try again!

Fine tuning the image. Once the image has been saved as a two layer .psd it is a good idea to make sure they are properly aligned. They won't match perfectly but the main subject (usually the middleground or background) should be as close as possible. This creates a foreground image which comes off the page toward you. I do this by inverting the top layer (Ctrl/Cmd+i) and reducing its opacity to 50%. You can now gently move this layer with the move tool or rotate slightly as necessary. Now you can see that when it is aligned the main subject will be mostly mid tone grey. If the image did need moving it will have to be cropped. Turn off the top layer to see where it's needed and crop as necessary. Any colour or tonal adjustments should also be made now. Remember to do exactly the same to both layers. Perform the channel swapping technique (action) then flatten and save the image. There are a few variations to this technique and a few different ways of doing more or less the same thing. I have found this way the simplest for repeatability and to get the most out of my own images but I encourage experimentation and above all have fun with it.



Katydid on a tree trunk

Resources

Glasses and more info on stereo images can be found at;
www.3dstereo.com