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Stereographs On Your Smartphone

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Stereographs On Your Smartphone

Abstract

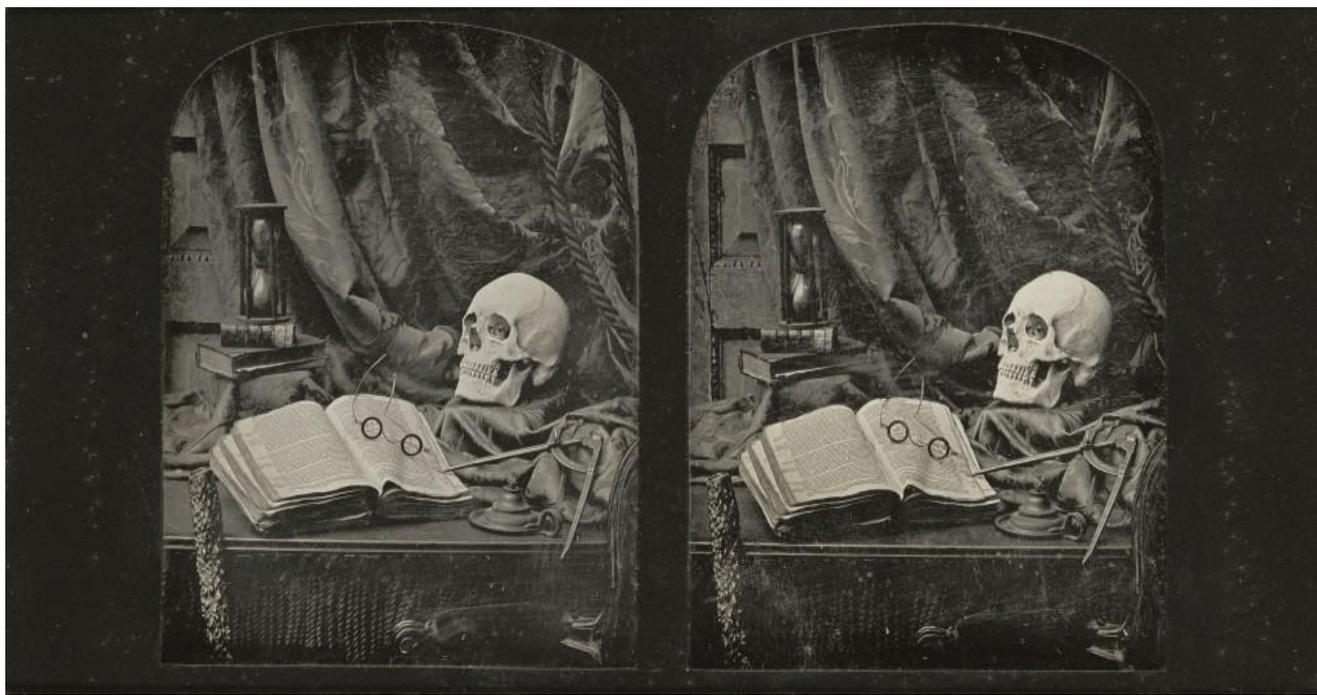
Many stereograph collections have been digitized and are now available online. The means to view them in stereo however may not be readily available for a general audience. Working with some filename modifications, the Stereogramator website from NYPL Labs, and a handful of different smartphone apps, viewing stereographs digitally in three dimensions is now possible. Students of visual materials, the history of photography, and other online researchers can now view the stereographs as the medium was originally intended to be viewed.

Keywords

stereograph, stereoscope, digital collections, digitization, photographs, technology, smartphone, review, Google Cardboard, virtual reality, VR

Author Bio & Acknowledgements

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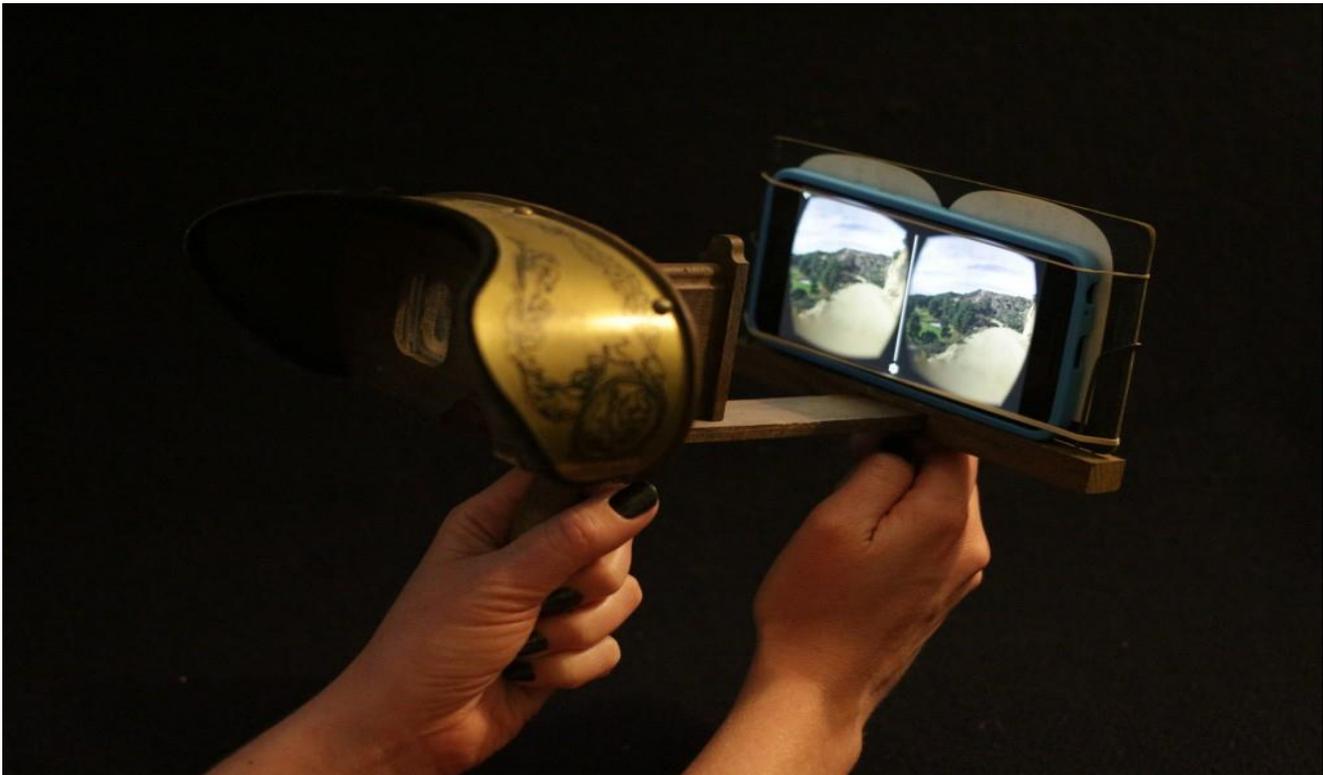
Thomas Richard Williams (English, 1825 - 1871), *The Sands of Time*, 1850 - 1852, Stereo-daguerreotype, The J. Paul Getty Museum, Los Angeles. Digital image courtesy of the Getty's Open Content Program.

Introduction

Do you have stereographs in your photographic collection? How about digital images of stereographs? How many of you have a stereoscope at the ready? Imagine how the average user of your digital image collection is viewing those digitized stereograph images. Students of visual materials, the history of photography, or researchers are seeing these digitized versions of stereographs on a computer screen with the two images side-by-side. Chances are they are unable to view them in stereo. What follows is how to view stereographs with a smartphone. There are options for both iPhone and Android users. Stereographs, once a form of mass entertainment, can be brought to life with the current form of mass entertainment - the smartphone. These modern viewing devices offer the thrill of mediated realism through historical images.

The J. Paul Getty Museum has a large collection (22,000+) of stereographs that are digitized and coming online soon, available for free hi-res download, in the Open Content program. The Getty Research Institute also has a bulk of stereographs, a portion of which are available online. Exciting, right? However, when one of these stereograph images is downloaded, you still see two images side by side. This is not quite the experience the medium was designed for.

The stereoscope, Viewmaster, and Google Cardboard, are devices that show images in stereo - with two lenses that show offset images to each eye and allow the brain to complete the image into one with the illusion of depth. These viewing devices trick your eyes into seeing 3-D. Professionals working in visual resources might have access to a stereoscope, but does the online audience? Researchers, students, and the general public are more likely to own a smartphone than a stereoscope. To get started with seeing stereographs on a smartphone, you'll need both a *viewer* with lenses and *apps* downloaded to a smartphone.



Early research & design with smartphone and stereoscope. Image courtesy of the author.

Getting Started

With the recent growth of virtual reality (VR) technology, there are many affordable viewers to choose from. VR is the use of computer technology to immerse the viewer in 3D imagery by incorporating motion tracking in addition to stereoscopic imaging. This allows you to view things in three dimensions and determine your own perspective in space. To acquire a viewer to use with your smartphone, there are various models available for purchase for \$15 and up at vr.google.com.¹ There's even a viewer made to look like the classic red Viewmaster for the nostalgic VR shopper. There are DIY instructions² available for building your own Google Cardboard viewer out of whatever materials you choose (plastic, metal, recycled pizza box, etc.). There are also more advanced devices--purpose-built head mounted displays (HMD) like Oculus Rift, and Samsung Gear VR, which still require a smartphone, but incorporate additional sensors for a more immersive experience.

Next, you'll need an app. The first one to download is **Google Cardboard** available for both Android and iPhone.³ This app will show you how to setup your viewer and provide a couple demos. **Google Cardboard Camera**, available on Android,⁴ allows you to create images and collect them in a gallery. YouTube has a whole channel devoted to 360° Videos⁵ to be viewed in your Cardboard viewer on any device. This includes everything from cooking, travel, produced features, to extreme sports. Open the video on your phone and look for the Cardboard icon in the bottom right corner of the video

¹ <https://vr.google.com/>

² <https://vr.google.com/cardboard/get-cardboard/#build-it>

³ Available for Android:

<https://play.google.com/store/apps/details?id=com.google.samples.apps.cardboarddemo&hl=en> and for iPhone: <https://itunes.apple.com/us/app/google-cardboard/id987962261?mt=8>

⁴ <https://play.google.com/store/apps/details?id=com.google.vr.cyclops&hl=en>

⁵ <https://www.youtube.com/channel/UCzuqhhs6NWBqTzMuM09WKDQ>

next to the full screen icon. There are many other apps that take advantage of stereo viewers. The **Bosch VR** app, available on both Android and iPhone,⁶ is particularly fun and incredibly surreal. The viewer flies (riding a fish!) through Hieronymus Bosch's painting, *The Garden of Earthly Delights*, visiting animated characters and points of interest throughout the landscape within each of the three panels of the painting.

Viewing Collections

Early experiments in viewing the downloaded stereographs on a smartphone failed. Reverse engineering the existing sample images in the image gallery led to the discovery of a unique filename extension. Modifying the downloaded stereographs by renaming the file with the following suffix, "filename.vr.jpg" and uploading to a smartphone allows images to show in the Google Cardboard Camera image gallery. This makes the images viewable in stereo. This is quite the workaround and not something a general audience would probably spend time doing. Luckily, there's an easier way!

Enter the **Stereogramimator**⁷ website from New York Public Library (NYPL) Labs. This website pulls stereograph images from the NYPL collection hosted on Flickr using an Application Programming Interface (API). From your web browser, there are a couple of options for viewing modified stereographs. One option for viewing is an animated gif or a "wigglegram" that combines the two offset images and rapidly switches between them; with the persistence of vision, this makes the images appear to move. Another option is the combination of the two offset images with the addition of red and blue channels so that the image can be viewed with anaglyph 3D glasses - the classic kind with red & blue lenses. Examples of these two types of 3D images can be seen on the Stereogramimator website. Both of these viewing options work on smartphones, tablets, and desktop computers.

Building on top of this idea from the Stereogramimator website and using the Flickr API of the NYPL stereograph collection is the **Stereogram** app, available on Android devices.⁸ By placing a smartphone in a Google Cardboard viewer and using this app, one can experience the digital stereograph images as a single image with depth. Previously, we were experiencing stereography from a fixed perspective. The Stereogram app adds in motion tracking to adjust the position of the dual images based on your head movement. Stereogram also has the ability to search by voice using the image metadata. Navigate to the search interface and ask for "Brooklyn Bridge" and the app will show you stereographs of the Brooklyn Bridge from the NYPL collection. If you'd like to see your own collections, you can add your images to Flickr or connect via API. Guidelines and more information can be found on the Stereogramimator website.

⁶ Available on Android: <https://play.google.com/store/apps/details?id=com.BDH.Bosch> and for iPhone: <https://itunes.apple.com/WebObjects/MZStore.woa/wa/viewSoftware?id=1051016062&mt=8>

⁷ <http://stereo.nypl.org/>

⁸ <https://play.google.com/store/apps/details?id=com.davidquaid.stereogramV2&hl=en>



Diagram of Stereogram screenshots

Conclusion

In *Techniques of the Observer*, Jonathan Crary notes that the stereoscope is “. . . inseparable from early nineteenth-century debates about the perception of space, which were to continue unresolved indefinitely.” It is fitting then to look back to early stereographs as virtual reality technologies evolve and new forms of seeing and experiencing space are defined. These two seemingly disparate mediums, stereographs and virtual reality, not only share the use of dual lenses in viewing apparatus, but also push the limits of human perception.

Viewing digitized stereographs on a smartphone can be a supplemental way to recreate the illusion of depth as intended from this popular medium from the nineteenth century. Whether learning about visual materials history or using these images as research materials, the experience of viewing in three dimensions can be richer than in two dimensions presented as side-by-side images. With these smartphone apps, students and researchers can get a sense through digital means, of what viewing images in a stereoscope feels like. The ability to view stereographs in stereo can give new life to digital collections and inspire audiences to discover these digitized photographic materials.

References

Crary, Jonathan. *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*. Cambridge, MA: MIT Press, 2001.

"STEREOGRANIMATOR." NYPL Labs: Stereogramimator. Accessed September 05, 2016. <http://stereo.nypl.org/>.