

On Study of the Volumetric Display Techniques In Interactive Media Arts Proceedings

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Abstract. As technology progresses, people expect the light to be able to paint images that are as close as they can be to the real world. People also have the desire to re-create what already exists in reality as a three-dimensional object. This study is focused on research on media art using volumetric display techniques and an artwork using the principle which is concave mirror is reflect light and creating images.

Keywords: Volumetric Display, Holographic Images, Interactive Media Arts, Concave Mirror, Reflective Surfaces.

1 Introduction

All things must reflect light in order to be seen. Just as one perceives the world through light that was reflected off of nature, Light, Nature and Human Beings mutually influence one another and they become the origin of all things. When first seeing a free-floating, 3D image, people are mystified by this futuristic technology. The volumetric display is defined as a presentation surface that creates the illusion of free-floating, 3D images. It is an innovative use of the Pepper' Ghost technique which is optical illusion relies on the reflection of light from a glass plate. This study will discuss how volumetric display/3D use the technic and create images and provide readers insight into how to build a feasible interactive work using concave mirror principle.

2 Related work

People will become familiar with the various techniques for the volumetric display of visual imagery. Unlike a traditional 2D screen, volumetric technologies provide the viewer with a feeling of "holographic" imagery based on the technique used to recreate a display in natural 3D space. The device called the i3Dg is a project that uses technique to separate a single 2D display or projection into multiple layers, which can be stacked up to recreate a foreground, middle ground, and background.

This technique could approach to solving the holographic display and experience illusion with a real sense of depth and motion parallax.



Fig. 1. The i3Dg accessory for iPhone utilizes three panes of plastic to create a multi-depth experience.

RealFiction provide pyramid-shaped systems that allow viewing from 180 to 360 degrees with either three or four separate channels of video corresponding to different angles. This technique also can enhance 3D/Holographic display and create the illusion of depth in an image.



Fig. 2. Dreamoc from www.realfiction.com

3 Interactive Artwork

3.1 Concept and functional

The artwork is a holographic art which is a sort of augmented reality using the principle which is concave mirror is reflect light and creating images. It is created in harmony of three important factors—object, space, and light. The video of tropical fish will be played on an iPad/MacBook screen that will be faced down on top of the fish ball tank. The light from video will be reflected on the surface of the inner glass and the image will be projected at the center of the fish tank. A person (the audience) can choose and press one of the three buttons that have primary colors of light—Red, Blue, and Green—and with a water drop sound effect, the tropical fish will change its color according to what the audience has chosen.



Fig. 3. Interactive holorium work images

3.2 Software & Hardware

The tropical fish were created through Maya (3D program) and the videos will be played on an iPad or a MacBook screen. The video will be reflected off of the inner surface of the fish tank and the video will appear to be at the center of the fish tank. Interaction of the sound and video will be controlled by using VVVV program. Touch sensor will trigger the Red, Green, and Blue LED lights, and Arduino that is connected to the illumination sensor will transfer the data to the computer, and the computer will control the video and sound.

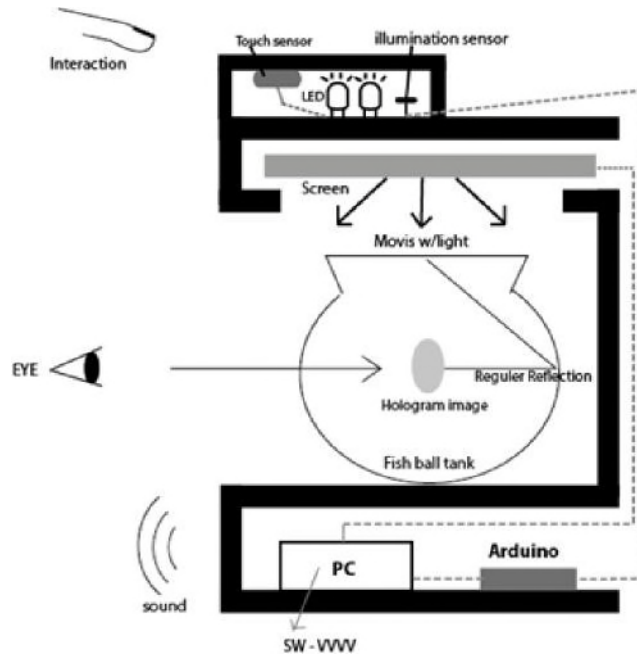


Fig. 4. Cross-sectional drawing for Working Process

4 Conclusion and Future Work

In this paper, we presented 3D/volumetric display techniques based on free-floating images using reflection of light and demonstrated a holographic image created by a concave mirror. In future work, it will be tried to add various interaction ways such as networking, app or leap motion which let user control the contents in artwork.

References

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