

Stereoscopic Media Art Based on Hand Drawing

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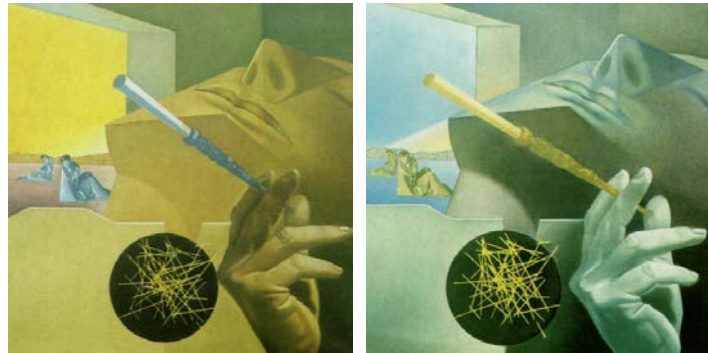
Abstract. In this paper, stereoscopic artwork based on hand drawing was produced based on binocular parallax. A stereoscopic image has the potential to be a new style of media, because it can provide a new experience to the audience by extending the depth and width of the sense of humans. In order to produce stereoscopic video artwork based on hand drawing, a left- and right-side video were shot while drawing images viewed from the left and right eyes and edited as a stereoscopic side-by-side video format. This artwork overturns the stereotype with the audience by changing a two-dimensional picture into a three-dimensional picture beyond simply showing the three-dimensional video.

Keywords: Stereoscopic art, Depth perception, Hand drawing

1 Introduction

A stereoscopic image can be used as a presentation of a new style of media, since it provides a new experience to the audience by extending the depth and width of the sense of humans [1]. Three-dimensional representation has been continuously studied in traditional painting [2]. The study of the expression of the stereoscopic image started in ancient times. Florentine painter Giotto di Bondone laid the foundation of perspective drawing to express spatial depth in the plane canvas [3]. The discovery of linear perspective by the geometry principle plays crucial role in expressing the sense of space. The perspective developed by many painters was an opportunity to create an infinite space on the screen. The space has been configured by monocular depth cue such as contrast and overlap with linear perspective.

The 'Holy Trinity' is a representative work of Masaccio drawn in linear perspective to create a new visual world of the Renaissance [4]. The artwork is expressed through Brunelleschi's application of mathematics and perspective to art and Donatello's representation of human body modeling. There are artists who try to work with the basic concept of stereoscopy, that human beings can feel a sense of space because they look different in left and right eye images. Salvador Dali applied stereoscopic artwork with 'The sleeping smoker' by drawing different images from the left eye and the right eye as shown in Fig 1 [5].



(a) Left image (b) Right image

Fig. 1. Salvador Dali <The sleeping smoker, 1972/73>

2 Stereoscopic Video Based on Hand Drawing

In traditional painting, the painter expresses a sense of space and realism by using perspective. Salvador Dali created the artwork that is the basis of stereoscopic images by drawing on two canvases based on the theory that stereo effect is caused by the different parallax of the left and right eyes. At the time, one could not exhibit using binocular disparity, because there was no technology that could deliver the stereoscopic image to the audience. However, it is easy to display stereoscopic images using current technology by using the left and right images. The production of stereoscopic video based on hand drawing is more complex than three-dimensional image artwork. After sketching based on binocular parallax using geometric computation, an artist draws left and right pictures on sketches for generating stereoscopic video with the traditional painting method using the brush.

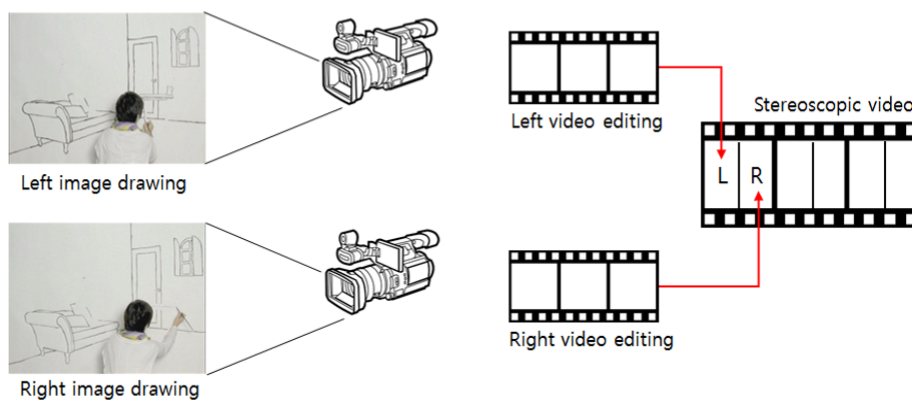


Fig. 2.The production of stereoscopic video

In order to produce stereoscopic video artwork based on hand drawing, the subject of the artwork was shot with a camera from the position of the right and left eyes. The left and right images are projected on canvases and sketched. As shown in Figure 2, the video was shot while drawing images viewed from the left and right eyes. The two videos were edited with the stereoscopic side-by-side format.

An artist begins to paint a picture on the wall in the video as shown in Figure 3. In the beginning of the stereoscopic video, the audience recognizes the 2D image because the artist draws on only the left-side video. After a while the artist starts to draw a picture on the right-side video. When the picture of the left- and right-side video overlap, an ambiguous sense of 2D and 3D appear. When the overlapping is increased gradually, the audience recognizes a 3D picture clearly. In the middle stage, the artists in the left and right video draw the same object at the same time. The process of drawing the same object gives the audience the feeling of painting in space.

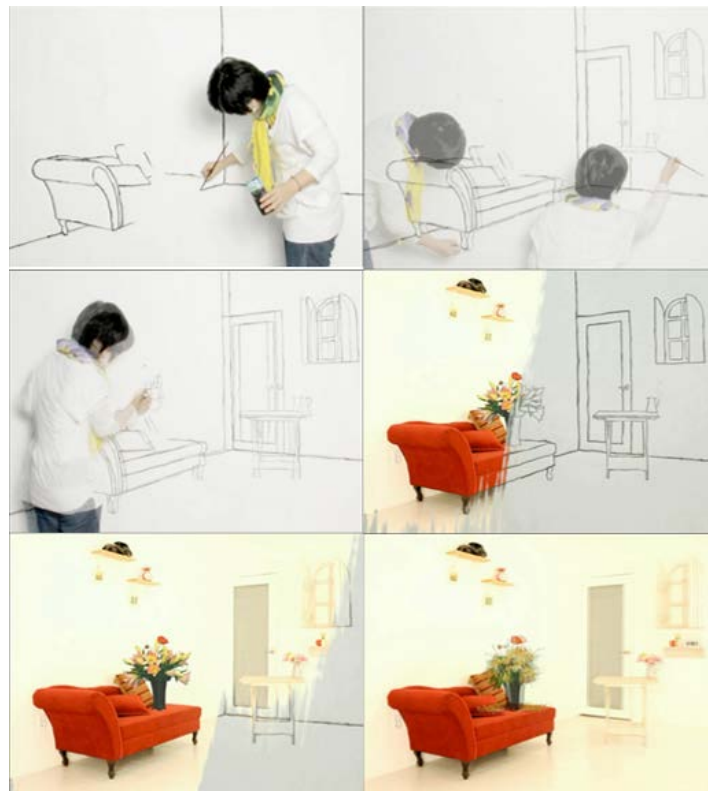


Fig. 3. YoungEun Kim, 'Between', 2011

3 Discussion

Although humans live in a 3D space, the human eye can recognize 2D images. The human brain recognizes a space by re-interpreting two images captured from both eyes. Most of the painting video is expressed in a two-dimensional image space. The audience has a two-dimensional picture of stereotypes. However, this artwork overturns the stereotype with the audience by changing a two-dimensional picture into a three-dimensional picture using stereoscopic technology.

References

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