Contemporary Engineering Sciences, Vol. 7, 2014, no. 23, 1271- 1278
HIKARI Ltd, www.m-hikari.com
http://dx.doi.org/10.12988/ces.2014.49157

A Study on the Components of Visual Perception in Media Artwork that Increasing Immersion

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Abstract

This study was intended to analyze and research the expression of visual perception theory in media art works using projection and to analyze how Gestalt visual perception principle was applied according to the artwork case analysis. To do so, this study explained about basic laws for visual perception in Gestalt psychology, the branch of psychological theory of perception, and classified laws analyzed to be most appropriate for visual contents used in the projection mapping into 4 main categories to progress research through law of nearness, law of similarity, law of continuity, law of closure, and examples of media artwork.

Keywords: Media Art, Immersion, Visual Perception, art Installation, visual communication

1 Introduction

Development of digital media technology enables diversification of media expression and new media is applied on objects or building's exterior surface as it made much influence on art and technology. Even for media art, media artworks

using projector is expanding a wide range of application by emerging as a representative expression technique using space and media and as a new visual communication through new nonverbal elements, and art and commercial researches are being carried out actively.

Media artworks using projector are being used as a new visual communication and digital visual contents-based artworks are forming the majority, and spatial and virtual expression is possible only when these visual contents are perfectly fused with video. When a person perceives a certain object by visual perception theory, a person is believed to perceive the overall characteristic faster than recognizing a part of the object. This is a theory of how people understand the object or event as a steady structure for it being most appropriate and simple when receiving information and see objects as they please. The visual perception principle based visual perception law will be helpful in advancing a basic theory for media artwork using effective projection. This would act as a media that delivers the artist's intention, and as it is accepted subjectively through imagination of viewers, a greater synergy effect beyond a simple information delivery can be expected and provides stronger immersion.

This study analyzed and researched the expression of visual perception theory appeared in the contents of artwork and analyzed whether the visual perception theory was applicable through cases of artwork that used projector. For the analysis, this study explained about basic laws for visual perception in Gestalt psychology, the branch of psychological theory of perception, and classified laws analyzed to be most appropriate for media artworks used in the projection mapping into 4 main categories to progress research through law of nearness, law of similarity, law of continuity, law of closure, and examples of media artwork. The purpose is to emphasize the importance of overall blending of projected object and visual contents than elements of the direct form in the media work, and to find elements of forming relationships(meaning, elements that create strong sense of immersion) between visual perception theory appeared in Gestalt visual perception theory and media artworks.

2 Visual Perception Theoretical Consideration

2.1. The concept of visual perception theory

Originally, the law of visual perception theory is used and the foundation can be found in the field of psychological theory, and is the term that is often quoted and used in the art field today. The Gestalt theory is expressed as the law of Gestalt and expressed as different laws by psychologists, and of these, 6 laws are believed to be applicable in the field of visual design. Also, many parts of the 8 laws analyzed to be appropriate for modern image field overlap with theories used in the field of visual design. The Gestalt theory is generally about a tendency of

interpreting information as a particular form to remember information easily in a process of images getting interpreted by brain through visual recognition that the visual perception is classified with similar context, and the five main laws include proximity, similarity, completion, continuity, and commonness. These laws provide basic guidelines for what type of structural combination that the object needs to make on the screen or subject.

2.2. Visual perception components

In Gestalt visual perception law, the tendency of classifying and arranging groups into positional elements of relevant components or characteristics as one of the principles that recognize forms is refer to as 'collectivity.' The visual perception law signifies a tendency of categorizing elements with similar visual elements when each unit has common features when people are perceiving the shape or tendency of showing one or two or more visual elements near each other into one group.

2.2.1. Law of Proximity

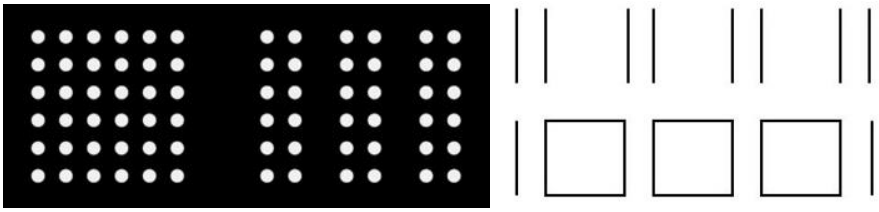

Figure 1. Law of Proximity

People have a tendency to group the objects visually into groups, and the law of proximity is a principle of perceiving objects by grouping them with other objects nearby. Also, there is a greater chance that two or more visual elements near each other will be perceived as a pattern or group than the two elements far away from each other.

2.2.2. Law of Similarity

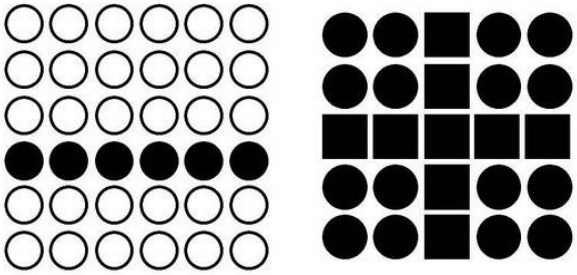

Figure 2. Law of Similarity

People choose the simplest and most stable shape to concentrate. This law emphasizes the importance of the most basic shapes as square, circle, and triangle. The law of similarity gives a sense of unification as elements of similar properties, such as similar shape, color, or texture, are perceived as a group even when they are placed distant from each other.

2.2.3. Law of Continuation

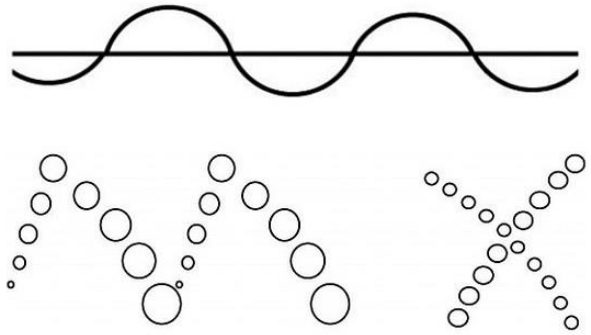

Figure 3. Law of Continuation

When a certain shape or group is forming a series with directivity, it can become an intrinsic characteristic of the overall shape that the arranged objects into a straight line or soft curve appear as one unit. The human brain seeks for the soft continuation as much as possible.

2.2.4. Law of Closure

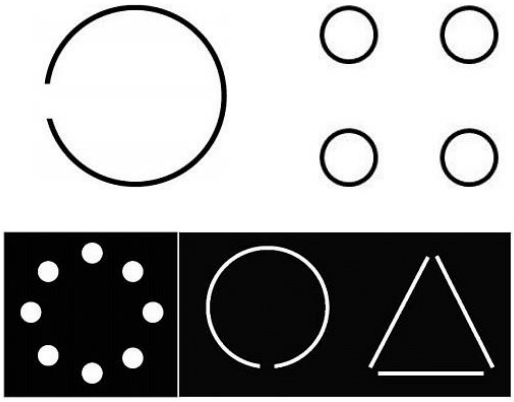

Figure 4. Law of Closure

Unstable shape. A figure that is not perceived as a complete shape or group based on existing knowledge appears closed or in groups psychology. Broken or discontinuous parts are perceived to make the whole shape (circle, quadrangle).

3 Cases of projection mapping in media artworks

3.1. Projection Mapping

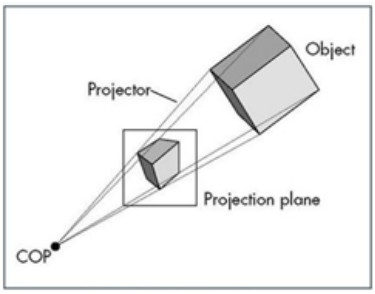

Figure 5. Perspective Projection

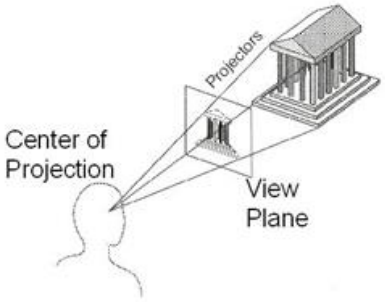

Figure 6. Optic projection

It is to create a new virtual space of reality and unreality vaguely making harmony by projecting light on an image through projector which was designed by considering the quality of material, color, and layout of the outer wall, interior space, or object to be used as a screen that it is one of the visual communication works of using optical illusion created by mapping the reality space on virtual space. It is explained as the concept of augmented reality and the object, used as a screen, expands virtual space as a media that expresses virtual space, and there is no limitation in expressing the 3-dimensional space.

3.2. Technical realization of the projection mapping

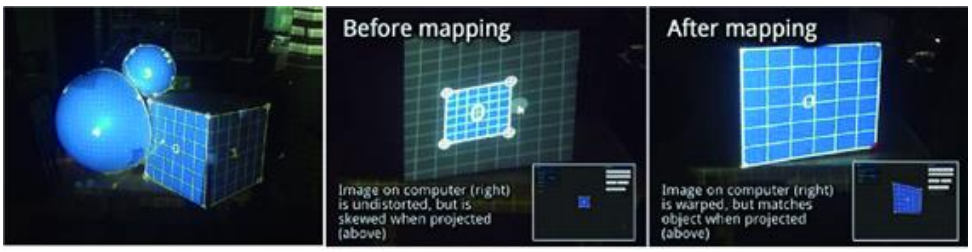

Figure 7. Image correction of Projection Mapping

The projection mapping shows augmented reality based on objects with projected 3-dimensional visual effect through video contents projected with a projector, and the virtual space at this time can be explained as the perspective projection technique. The 3-dimensional shapes and 3D modeling created in virtual space are formed during the projection mapping work using 3D graphic program then maps the desired external image, and the mapped external image has realistic image of 2-dimensional surface formation. It is a technique of showing the augmented reality by projecting visual contents on building, object,

or sculpture with an optical instrument and using optical illusion effect appeared on projected area that it is a behavior of imprinting the illusory space created by light on physical subject of reality and images of original sculpture as a sculpture with new character through visual contents.

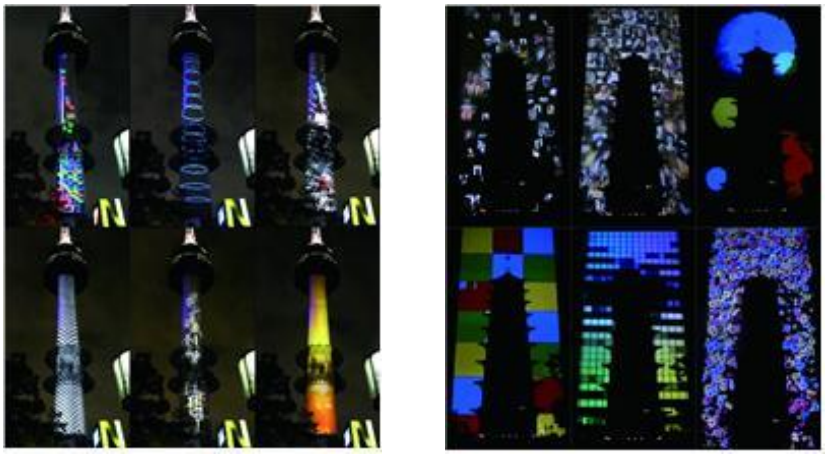

Figure 8. Seoul Namsan N tower and Gyeong-ju, The Story of Millennium Light 2011

3.3. Seoul Namsan N Tower projection mapping 2011

A projection mapping artwork composed and displaying 16 episodes according to the technical arbitrary decision through symbolic topics that represent Korea and Namsan Mountain under a topic 'The spirit of Namsan Mountain soaring up (see Figure 8).'
Characteristics of narrow and long shape, called restrictive column, were actively used to express a neon ring that came down vertically converting into a structure, a scene of dancheong(traditional multicolored paintwork on wooden building) wrapped around a column wiping vertically like a fabric, and a scene of water getting filled up in a narrow and long casket to create expansion in limited space. This work can be considered as an artwork that expressed the tension which showed a special quality of limitation appeared in space of visual perception theory, however, the theoretical unity of visual perception is not apparent in structural characteristic of objet compare to the contents configuration.

3.4. Gyeongju World Culture Expo, the Story of Millennium Light 2011

It is a projection mapping work with Gyeongju Tower, the engraved 2011 Gyeongju World Culture Expo Wooden Stupa at Whang Lyong Sa temple, as the background (see Figure 8). It is an artwork of magnified expressivity of video contents that changed the implemented space by existing objet of engraving structure into characteristics of space with playful characteristic. Fantastic perform-

ance atmosphere was created with the image beauty of contents that can be seen with the law of fancy continuity and law of similarity, and this appeared as the relief of closeness from structural aspect.

4 Conclusion

As a result of analyzing the artwork cases that used a projection with visual perception theory, similarity and continuity appeared the most among 4 characteristics, and these visual-perceptual components were expressed for a feeling of space to be recognized. Also, these elements are expressing strong immersion and depth, meaning a three-dimensional effect, to express the sense of space.

Effective conveyance of the meaning is possible when implicative expression or symbolic expressions in the projection mapping are expressed based on the visual perception theory, and this is because viewers absorb general characteristics, as vision, hearing, and environment preferentially when they perceive the projection mapping scenes. Research on various techniques that can express these visual elements need to be conducted in the future, and these researches are expected to develop effective functions of visual communication.

References

[1] Varney Allen. Immersion Unexplained. The Escapist Magazine, vol.57, 2006.

[2] Jennett, C. Measuring and Defining the Experience of Immersion in Games. International Journal of Hu-man Computer Studies, Vol.66, No.9, pp.641-661., 2008.

[3] F.L. Azuma, Ronald. A Survey of Augmented Reality, In Presence: Teleoperators and Virtual Environments Vol.6, No.4, pp. 355, 1997.

[4] Richard D. Zakia, perception and Imaging.

[5] Chan,L.,Chanjoo, A Study of Interaction Projection Mapping and Its Realization of Types of UX Interface, Journal of Digital Interaction Design. Vol.11, No.2, pp135-146, 2012

[6] Rudolf Arnheim, Art and Visual Perception: A Psychology of the Creative Eye (Berkeley, CA: Univ. of California Press, 1954; revised 1974)

[7] Csikszentmihalyi, M. Flow: The Psychology of Optimal Experience, New York: Harper Perennial, 1990.

[8] Robert L. Solso, 『cognitive psychology』

[9] Hyun mi Kim, Inquiry for the visual based on the cognitive and Gestalt psychology, The Graduate School of Design, Ewha Woman's University, Republic of Korea [2002]

[10] Modeling Real-Time applications with Reusable Design Patterns, Saoussen Rekhis, Nadia Bouassida, Rafik Bouaziz, Claude DUVALLET, Bruno SADEG, p71-86, 2010

[11] ChangYong Jung, Woncheil Lee, Hyunggi Kim, Increasing in sense of Immersion in Interactive Media Artworks, Workshop Series on multimedia 2014 4th , Jeju National University.

[12] 3D Particle Position Measurement via Defocusing Concept, Xialoi Bao, Muguo Li, p1-10, 2010

[13] A Survey of Image steganopraphy Techniques, Mehdi Hussain and Mureed Hussainp113-124, 2013

[14] Designing the Multimedia Push Framework for Mobile Applications, Dongcheul Lee, p117-124, 2011

[15] http://www.youtube.com/watch?v=CR3Jy0FdBSY

[16] http://www.youtube.com/watch?v=PRV8ZdqCzb4

Received: August 16, 2014