deBallution – Interactive Artwork by Throwing Pseudo Balls Based on Cultural Heritages

Je-ho Oh *
GSCT, KAIST

So-young Kim †
Independent Artist

Yun Tae Nam ‡
MADA, Monash University

Chung-kon Shi §
GSCT, KAIST

ABSTRACT

The interactive artwork "deBallution" is to catch audience members' throwing movements on a virtual screen and drawing various generated kaleidoscope images to predict points from the audience throwing on the screen. Audience members threw the pseudo-balls for large-size screen and caused symbolic digital revolution, devolution.

Keywords: Public spaces; Participatory art; Interactive artwork; Pseudo balls; Cultural heritage;

Index Terms: I.4.8 [Image Processing and Computer Vision]: Scene Analysis—Motion; H.5.1 [Information Interfaces and Presentation]: Multimedia Information Systems—Artificial, augmented, and virtual realities

1 MOTIVATION

The main motivation of this paper is to produce a digital interactive artwork, building on a cultural archetype. Cultural heritage directly supports public interactive artworks in audience action and in the embodiment of contents. This audience action not only involves body movements from passive observers and performers for choosing the scene; it also involves generating energy for changing social views of politics. Through cultural heritages, it was possible to extract original emotion and activity from the human universal model and derive artwork's contents - narrative, visualization, sonification, and embodiment of artwork's objective. For example, "Drag a Star" was an interactive installation artwork that gave audiences an immersive and stunning interactive experience to remember the Greek myth of making wishes upon a shooting star. [1] For another example, a digital video artwork reflecting human figures has illustrated narcissism. "Under Scan" by Rozano was based on the Narcissus myth, reflecting and changing contents under the shadow of audience feet. [2]

2 ARTWORK CONCEPT

The basic artwork concept is to make new artwork form audience members' whole-body action. The audience action will influence social values, mediated by public media [3].

* e-mail: anomewho@kaist.ac.kr

† e-mail: ahyne@naver.com

‡ e-mail: yun.nam@monash.edu

§ e-mail: chungkon@kaist.ac.kr

The meanings of the interactive artwork title "deBallution" are as follows. First, it means a digital revolution by throwing balls, a symbolic revolution mediated by digital artwork, a change from tradition to digital technologies. Second, it means devolution by throwing balls. Devolution is the transfer of some authority or power from a central organization or government to smaller organizations or government departments. The audience here performs symbolic devolution. Why did we focus on the throwing action in the artwork? The throwing action is related to our motive which was "overthrowing a society." This artwork referred two throwing games that are part of different cultural heritages involved in "overthrowing a society" - "Stone War" from Korean traditional play and "Battle of the Oranges" from Ivrea in Italy. And then, we made main five stages for scenario design revised by theoretical research making interactive artwork by narrative of cultural heritages.

① Environment setting – A video about a city landscape played on screen.

② Audience mission – Audiences participated in the video on their own and disrupted the moving images.

③ Audience action – Audience members threw pseudo-balls in front of the screen progressively

④ Story development – Throwing action generated kaleidoscope images in different sizes by phase—strong, middle and weak. Generative kaleidoscope images expanded automatically.

⑤ Climax and ending – When generative kaleidoscope images filled the screen, disruptive video contents played. After disruptive video contents finished, an ending video about the new world Theory

Figure 1: Examples of Basic Design "deBallution"

3 ARTWORK REALIZATION

3.1 Kaleidoscope Design

The main concept of graphic design is to visualize audience throwing action to generate new images on the throwing point. The contents express visually that participants desire to overthrow reality by throwing. The first screen images are realistic and fanciless, reflecting everyday life. After participants throw, a festival starts on the screen, but the screen begins to be damaged. At any point where a participant throws, a kaleidoscope image expands just like images of crushed oranges. The throwing action has usually happened at festival in the past. The throwing action in this project means that participants gather and they set off firecrackers by making a festival. The kaleidoscope images are like firecrackers and reminiscent of festivals. The many points of the action signify the many participants. From a point of audience pseudo-throwing balls to a process of image creation, we considered the kaleidoscope (kalo = beautiful, eidos = form, shape, skopeo = I look, examine in Greek) as visual aesthetic and inspiration. We take this visual experience of spatial perception into digitally translated 3-D form and generative animation of a kaleidoscope in real time, based on constantly change of shapes and colors of the ball thrown by the participant.
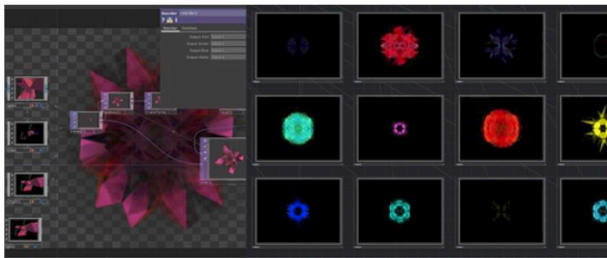

Figure 2: Still Image of 3-D Generative Kaleidoscope.

3.2 Technical Design

To design an interactive gesture-based system, we concerned on Natural User Interfaces (NUIs) approach as the way of interacting with digital objects alike a natural feeling of interacting with real world objects. The workflow of "deBallution" consists of gesture recognition, data analysis from Kinect and interactive projection system, in relation to the graphic design of creating moving images: 3-D Generative Kaleidoscope, Background Video and Distorted Video.
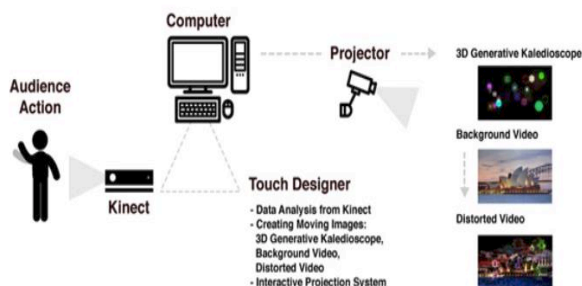

Figure 3: Workflow for "deBallution."

To recognize the movement of the human body, we analyzed positional and skeletal tracking data from Microsoft Kinect sensors to get more accurate recognition of the audience throwing action. To communicate between the Kinect hardware and computer programming software, we used Touch Designer, which is not only a visual development platform, but also a data visual analysis tool. To get a constant user detection, at first we used the Face Tracking option in Kinect. We examined different throwing styles through six participants' hand gestures when the user act pseudo throwing balls. This experiments had been visualized to get a better understanding of data and information, using built-in Kinect operators: TOP (Texture Operator) and CHOP (Chanel Operator) in Touch Designer. The patterns of the audience's throwing experiences were used to describe interactivity in levels (low, medium, high). The "high" level of interactivity concerns a meaningful interaction between the system and the participants. The audiences become active authors or creators. The diversity of interactivity levels comes in different shapes, sizes, and colors of 3D generative kaleidoscopes. For instance, high-level interactions make bigger sizes, dynamic shape changes in animation, and vibrant shades of red. Based on color theory, this is associated with different meanings: energy, strength, power, and celebration.
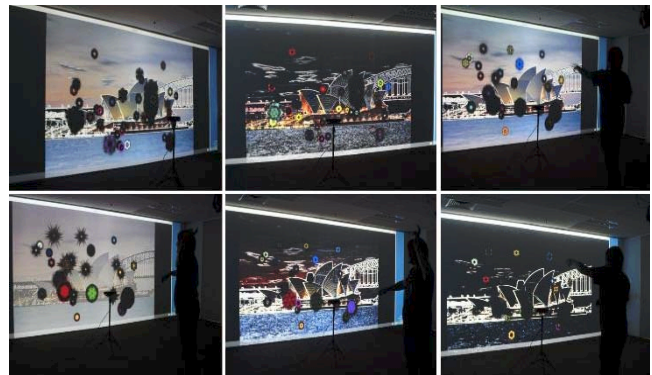

Figure 4: Realization for Public Interactive Artwork "deBallution."

3.3 Discussion

What elements of the social structure will change in the public interactive artwork by audience action based on cultural heritages? For the public interactive artwork "deBallution", we will solve this question.

REFERENCES

[1] She Al James et al. Drag A Star: The Social Media in Outer Space. Proceedings of the 23rd Annual ACM Conference on Multimedia Conference. ACM, 2015.

[2] Kriss Ravetto-Biagioli. Shadowed by Images: Rafael Lozano-Hemmer and the Art of Surveillance. Representations Vol.111 No.1, Pages 121-143, 2010.

[3] A. Best-Dunkley, and M. Puustinen. RE/F/r. ACE: a participatory media artwork. Digital Creativity Vol. 23 No. 2, Pages 136-143, 2012.