

Implementation of Interactive Self-portrait using Real-time News Stream

Sooyeon Lim*

Department of Game, Dongyang University, Korea
sylim@dyu.ac.kr

Abstract

This study is about the interactive self-portrait which provides the experience of self-consciousness reflection of the viewer to modern people who are easily alienated in rapid social change. We proposed interactive self-portrait is implemented by an interactive mirror that reproduces the appearance of the viewer acquired using a webcam. The interactive mirror, which can directly project its own image, is drawn by searching news articles in real time and using the extracted characters as pixel information in real time. The viewer has the opportunity to experience a new style of active self-expression while watching his/herself composed of news characters that are issues of modern society. The virtual self-portrait designed with news characters can attract viewers' attention by visually expressing the interests of modern people and can act as an incentive to generate positive interaction.

Keywords: *Self-portrait, Interactive Mirror, Real-time News, self-consciousness*

1. Introduction

Human desire to explore self has long been the main theme of many philosophers and has been expressed by many artists as artworks of self-portrait. Self-portrait refers to a portrait painted by a painter as a model of himself. Since the self-portrait is modeled by the painter himself/herself, he/she can draw his/her own image at any time without restriction, has the advantage of informing himself/herself of the picture and leaving it in the posterity.

As the artist draws a portrait, the artist recognizes and observes herself as an object of painting and draws her ideal image on the canvas. He expresses the ideal self that wants to be seen by others, and reflects the objectified self. Mirrors have long been used as a means of recognizing oneself. To draw a self-portrait, the artist looks into the mirror, and on the contrary, the mirror looks at the artist outside the mirror. The confrontation with oneself is to project, not to recognize only the appearance of oneself. Thus, observing oneself objectively becomes reflection as well as visual observation. In the rapidly changing modern society and the spread of personalized media, people lose their meaning and identity and experience alienation. In such environment, we feel the need to identify the identity of the self through digital mirror and interactive

self-portrait [1-2].

The purpose of this study is to provide a self-portrait which provides the experience of immersion to the viewer to the problem of self-consciousness. The image of the viewer facing the artwork is shown in real time as a digitally changed image photographed by video. The image of the viewer entered through the camera consists of characters of real-time news from three domestic and foreign portal sites. The reason why the pixel unit composing the self-portrait image is composed of the real-time news characters is to express the world living in the flood of information and knowledge as the mobile age becomes full-scale with the emergence of smart phone.

2. Related Works

2.1 Cultural history of self-portrait

The self-portrait in classical meaning starts with the desire of man to know himself. Self-portrait, which is a combination of self and portray, is interpreted to mean self-extraction. Self-portrait is a unique and inner art. It is a recording of what the artists have observed as a picture that others can see. Through their artwork, they communicate with the viewers and gives meaning to life through it.

For man, the question of his existence and the effort to solve it have long been subjects of philosophical inquiry. Early on, many philosophers have dealt with the problem of being, and in particular curiosity about the existence of self was the starting point and the end point of such a problem. Artists have also created many artworks in the form of self-portrait to explore their existence and express their inner world. Numerous artists such as Albrecht Dürer (1471-1528), Rembrandt Harmensz van Rijn (1606-1669), Vincent Willem van Gogh (1853-1890) and Edvard Munch (1863-1944) have expressed their concerns and reflection on their existence through self-portraits. Why did artists make self-portraits? The reason is that it is because it is the easiest and most accessible model and it is the instinct of manifestation of human narcissism.

Through his self-portrait, the artist depicts himself. He draws the image he wants to show to others, and draws the ideal self he thinks. Self-consciousness is an important motive for self-portrait along with identity as a consciousness of oneself. The self-consciousness associated with the artist's view through the mirror is likened to Lacan's mirror stage. According to analytical psychology of Jacques Lacan (1901-1981), the most important thing for human being to perceive himself as a subject is the image, and the mirror stage that makes him see himself as an independent image is the most important for forming the subject [3].

A mirror is a device that looks at itself through the eyes of others. Because human beings cannot look directly at themselves, they are in an ironic situation where they cannot directly observe themselves, which they think they know best. As a result, they use mirrors to see themselves. Thus, for a long time, mirrors have been considered as objects of philosophical thought.

2.2 Interactive self-portrait using digital mirror

The development of digital technology has transformed the form of self-portrait into an interactive self-portrait through a digital mirror. A digital mirror is a device that shoots a subject with a real-time camera and then displays it through a video device. In this process, the image information captured by the camera can be transformed using a computer or the like. Therefore, the digital mirror can be utilized in the artwork of revealing various shapes hidden in the interior through proper processing intended by the artist rather than showing the object's appearance as it is.

The classical self-portraits captured only one moment of the artist and showed only one side of the artist. On the other hand, the digital self-portrait can display various changes of the screen, which can express the artist's intention better. Digital mirrors go beyond the limitations of classical mirrors that provide a realistic representation of the object's physical appearance by providing a software processing technique that can represent internal truths. Therefore, the digital mirror is faithful to the function of the self-portrait that expresses the inner properties of the subject rather than the outer properties of the subject. Because of these advantages, the digital mirror is suitable for realizing an artwork that raises questions about self-consciousness and reflection to the viewer and provides experience immersed in the process.

For example, Daniel Rozin is a representative writer using digital mirrors [4]. Daniel Rozin's self-portrait varies by camera, motor, computer and expression material. First, when the camera recognizes the viewer, the form information of the viewer is transmitted to the motor and the material attached to the motor is moved to create the shape of the viewer. Therefore, it is made into different artworks depending on the material attached to the motor. Therefore, the most important thing in Rosin's digital mirror is the material attached to the motor. This serves as a pixel that is a material for representing the shape of a viewer as a digital image.

Figure 1 is the 'Angles Mirror' by Daniel Rozin's artwork in 2013. The material of this artwork is plastic spokes. This uses Kinect motion sensors to control the angles of motors attached to 465 plastic spokes to reproduce the movement of the viewer [5]. Figure 2 shows 'PomPom Mirror' in 2015 using faux fur pom poms as the material of the artwork. When the camera on this artwork recognizes the viewer's movement and sends information, 464 motors reproduce the form of the viewer by moving 928 (464 white + 464 black) faux fur pom poms [6].



Figure 1. *Angles Mirror*, Daniel Rozin, 2013



Figure 2. *PomPom Mirror*, Daniel Rozin, 2015

3. Implementation of interactive self-portrait

This study is about an interactive self-portrait that provides the viewer's experience of self-consciousness reflection. The proposed interactive self-portrait is implemented by an interactive mirror that reproduces the appearance of the viewer acquired from the webcam.

3.1 System overview

Interactive mirror consists of two processes. The first process is to create the material that composes the pixels to reproduce the portrait image of the viewer and the second process is to actually draw the portrait image using the shape information of the viewer acquired from webcam.

In this study, we selected the Internet news articles which cause constant social controversy as the material of the pixel image that constitutes the portrait image of the viewer. We search news articles in real time from

3 representative domestic and foreign portals, extract characters composing articles, and utilize them as pixel unit images constituting portrait images. Figure 3 shows a system overview of the interactive self-portrait.

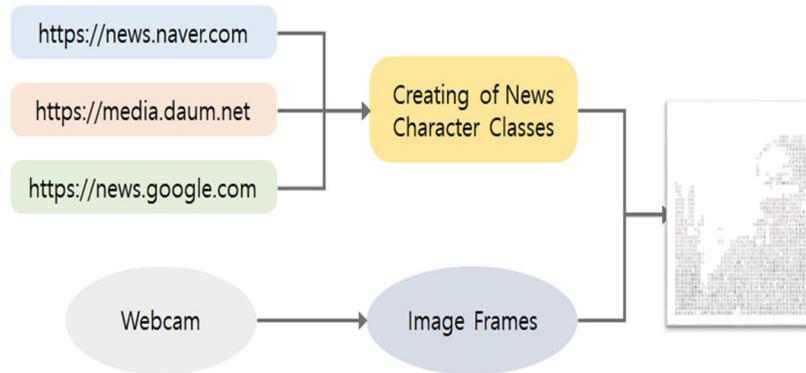


Figure 3. Interactive self-portrait overview

The image consists of lines. The essence of the line is the dot. Images are made up of small dots to form subtle color changes and shapes, which can be freely varied in size by the number of points. The dot is a simple form, so it can contain various emotions. It is the first element for composition and also means dissolution and division. The interest in the forms and elements that make up the image has increased from using a computer program. Digital images are transformed to leave the original image and serve as a bridge for a new and fantastic space [7-8]. The image can be duplicated, and the dot can represent all the emotions that make up the human life. We use news characters, a controversial issue in modern society, as a component of images. This proposed self-portrait dissolves the external appearance defined by the other person, and utilizes it as the main factor to newly reconstruct the figure of the person by the subjective view. Figure 4 shows an enlarged image of an interactive self-portrait consisting of news characters.

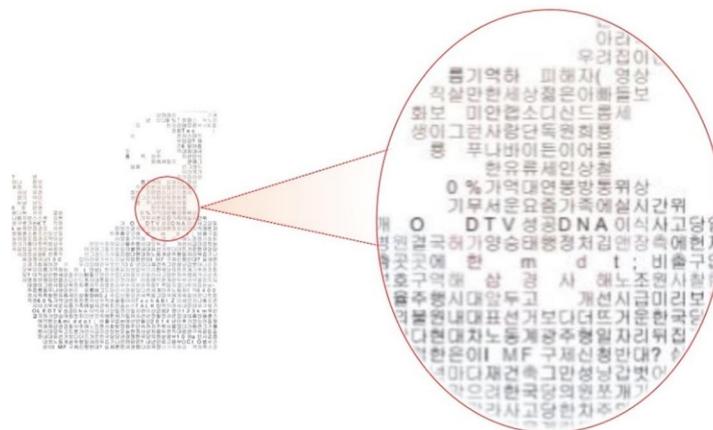


Figure 4. An enlarged image of an interactive self-portrait consisting of news characters

3.2 Representation of self-portrait using real-time news stream

The way people see news is changing over time. Most of the news consumption on the Internet is happening in the portal. According to the Digital News Report 2017 published by the Reuters Institute, online consumption of news (74%) surpassed news consumption via TV (69%) [9]. Internet portal sites do not produce news articles directly, but they have a great influence on distribution and consumption as distributors of news. Modern portals are advancing algorithms to recommend faster and more accurate information and articles that are close to individual user preferences, one of which is real-time news.

People spend time searching for online news if they are curious and interested, without thinking they are the necessary information or useful knowledge. Nonetheless, the virtual space of the Internet offers freeness to humans, but at the same time, the problem of losing human identity is constantly being raised. In this study, we try to realize the self-portrait of modern people exposed to all kinds of information and knowledge in the digital era. We use internet news texts, one of the Internet media that threatens human identity as self-portrait expression media. To do this, we extract news data from three Internet portal sites in real time and visualize the text data.

Under the assumption that real-time internet news is valuable as a factor reflecting modern people's interests, we extracted real-time news strings from three domestic and foreign portal sites, Naver, Daum and Google's news web pages. The extracted news string creates a character class for each news and stores the characters composing the news in the listed order. The constructed character classes should be updated in real time, but we have specified the update time in consideration of the efficiency of the system. As a result of analyzing the update cycle of real-time news of each portal, the update time of the news was different according to the portal and maintained the schedule update time. Considering the situation of all these portals, we set the update time to 30 minutes. Of course, this is due to subjective judgments based on statistics and is controversial [10].

The stored characters are used as pixel information for image visualization of the viewer acquired from the webcam. Internet news extracted from portal in real time is classified according to news, and character classes are generated, and then waiting for connection with image information of the viewer acquired from the camera. When an image frame is delivered to each character class, the output position and color of the characters are determined according to the information of the image frame, and then the resultant image is drawn. Figure 5 shows a data flow diagram for interactive self-portrait drawing.

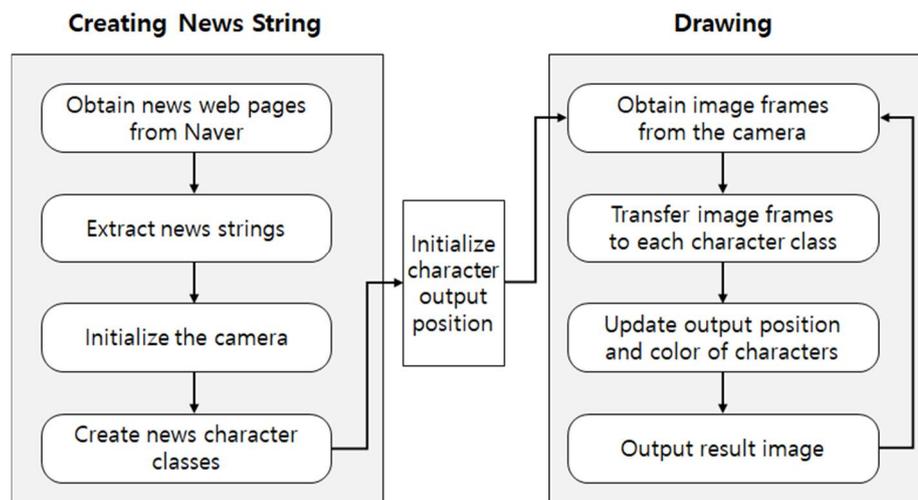


Figure 5. Data flow diagram for interactive self-portrait drawing

Extracted news texts contain many special symbols as well as Korean and English. Sentence symbols such as “ ”, “\”, “””, “. ”, “, ”, “ [”,“] ”, “...” were arbitrarily adjusted so as not to be stored. The proposed interactive self-portrait was implemented using processing (Processing 3.3.6) and Logitech C920HD Pro Web Cam.

4. Exhibition and analysis

The interactive self-portrait proposed in this study was used in the exhibition as shown in Figure 6. We installed a webcam on the wall facing the viewer, and the self-portrait image was reproduced by the front projection method.

The digital mirror reproduces the image of the viewer, which is transformed and recreated by modern hot news, not the viewer's original image. As a result, the viewer becomes more immersed in the interactive mirror. As the viewer becomes the center of the artwork and the artwork changes to the appearance of the viewer, the viewer reacts more actively to the artwork and experiences the interactivity.



Figure 6. A viewer with an interactive self-portrait

The experience of self-consciousness proposed in this study is the theme and essence of the artwork that should be provided to the viewer who appreciates the artwork. Therefore, the interaction with the viewer is very important for the completion of the artwork. In the Interactive self-portrait, where the viewer is shown in real time, the viewer who experiences the reality and responds to the artwork is the main character of the artwork. The role that the artist plays in the works is about how to transform the appearance of the audience. Thus, the interactive self-portrait involves the efforts of the viewer to find the code hidden inside of his or her transformed image projected in the artwork. The viewer takes a variety of poses in front of the artwork and creates new interpretations while viewing the reflected images.

5. Conclusion

This study is the result of a review of the problems of self-consciousness of modern people who are easily marginalized in rapid social changes. We implemented an interactive mirror that uses a digital mirror as a medium to project a viewer's image directly to provide narcissism. The proposed interactive self-portrait is drawn by searching news articles in connection with the Internet in real time and using characters extracted from them as pixel information. Therefore, this self-portrait is a dynamic self-portrait composed of news that reproduces the viewer's self-consciousness in the inner aspect and updates and reflects the interests of modern people in the outer aspect.

The viewer has the opportunity to experience a new style of active self-expression while seeing themselves composed of news characters that become issues of modern society. The virtual self-portrait designed with news characters can attract viewers' attention by visually expressing the interests of modern people and can act as an incentive to generate positive interaction.

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