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# GaZone: VR Image Browsing System Providing Feelings of Happiness

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**Abstract.** In this paper, we propose GaZone, a system providing happiness through unusual immersive experiences surrounded by their favorite images. GaZone provides a function to search images on the Web and easily collect them in the VR environment realized by the head mounted display. The user immerses in the unusual environment surrounded by many images suited to their preference, resulting in experiencing the happiness that cannot be obtained by the conventional systems. From the user study, it was confirmed that users felt happiness and their hearts were moved by being surrounded by their favorite things.

**Keywords:** Happiness · Image search · Possession · Virtual reality · Entertainment

## 1 Introduction

Realization of happiness is important for humans to live a fruitful life [9, 4]. One of the ways for human beings to get the feelings of happiness is to gather goods that match their tastes and arrange them around themselves. Knutson et al clearly indicated that one’s mere imagination of buying something makes the state in the head almost the same as when he or she actually bought it[3]. Simple look at the images of one’s favorite goods strongly stimulate the nucleus accumbens, which is the pleasure center of the brain, and the brain gets filled with dopamine. That is, it is assumed that our viewing of the favorite things arranged around us will bring us the similar effect. In this paper, we focus on the happiness that can be felt by users when they collect their favorite goods and put them around themselves.

However, anyone cannot always put it into action easily. There are restrictions on securing necessary economic strength for collection (economic constraints) and on ensuring necessary physical space for installation (spatial constraints).

In this paper, we propose GaZone, a system which allows users to feel happiness without being bound by economic or spatial constraints. First, in order to reduce the economic constraints when collecting things, GaZone introduces a means of “obtaining images of user’s favorite things”. Also, it utilizes “VR environment” to eliminate the spatial constraints when arranging things, and has the function of “changing layout by intuitive operations” such as grasping

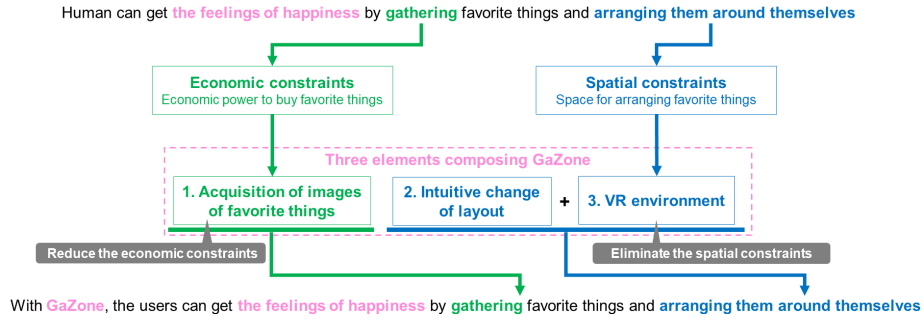


Fig. 1. Concept of GaZone

with a controller, to provide the feelings that users can actually arrange things with their own hands as shown in Fig. 1.

In addition, it is expected that the users can feel a kind of possession<sup>1</sup> of favorite things from the elements of “acquisition of images of favorite things” and “intuitive change of layout”. Similarly, it is expected that the users can feel a kind of unreality from the elements of “VR environment” and “intuitive change of layout”. It is thought that these feelings also contribute to form the “happiness” that GaZone brings about.

## 2 Related Research

Conventionally, systems allowing any 3D objects to be displayed and freely browsed have been proposed [1], in contrast, GaZone, the proposed system in this paper, provides the immersive experience including elements as size and distance because it displays the objects in the VR environment.

Ichikawa et al. proposed VR Safari Park as the interface with interactivity using the VR environment [7]. This is a system where users combine the previously prepared block-like objects, resulting in inflating imagination and promoting new discoveries, whereas GaZone utilizes a large number of images on the Web being freely displayed around the user and provides the feeling of happiness. There is another existing service which has a function of image search in the VR environment, called “COMOLU”<sup>2</sup>. Meanwhile, GaZone aims to make the user feel happier by interface providing certain feedbacks.

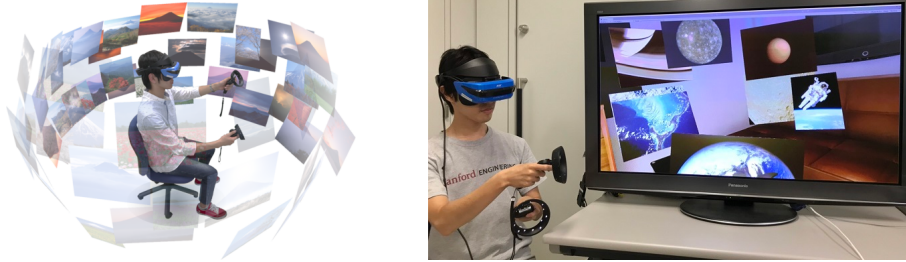
In addition, recent investigations have demonstrated that VR environment can be effectively used to alleviate pain and discomfort in medical care [6, 2]. In these studies, the VR environment was used to alleviate the pain and discomfort felt by humans, whereas in GaZone is used to induce human happiness.

<sup>1</sup> The feeling of possession refers to the feeling when we can handle or arrange them freely. It does not necessarily include the ownership towards the target thing.

<sup>2</sup> <http://comolu.info/>

### 3 Proposed System

We propose GaZone, a VR system where users can fetch many images of their favorite things and arrange them freely in their surroundings for browsing evoking happiness (Fig. 2). We made the promotion video for explanation [8].



**Fig. 2.** A user experiencing GaZone

GaZone is a new system providing users the feelings of happiness, and composed of three elements, namely, the function to obtain a set of images of user's favorite things, the VR environment where the set of images are displayed around the user, and the function allowing the user to intuitively change the layout of the displayed images. Specifically, when the users' favorite keyword is received by voice, the images on the Web are searched and the obtained group of images are displayed around the user (acquisition of images). After that, users can pull images of interest closer to them in the VR environment, and perform operations such as selection, movement, scaling, and so on (intuitive layout change). Users can freely repeat these operations, and an environment where the feeling of happiness can be obtained is developed.

As a user of GaZone, ordinary people over junior high school students are mainly assumed who have experience in image search on the Web and has no hesitation in using the VR environment. In addition, it is expected to be particularly effective for users who have economic difficulty in freely purchasing their favorite things, or difficulty in securing a space for physically arranging them.

### 4 Evaluation Experiment

Here, we have the users experience the proposed system in the following three ways, and discuss the effect of the system.

First, we underwent the assessment by Qualification trial<sup>3</sup> at an academic conference, Entertainment Computing 2018, in order to confirm whether GaZone

<sup>3</sup> Framework of the value standard in the field of Entertainment Computing research. The applicants describe how they want the users' minds to be moved and what

provides the feeling of happiness and possession. As a result of having undergone the assessment, the Qualification committee qualified the usefulness. It was confirmed that the “feeling of happiness” was evoked by being surrounded by the favorite images. In addition, the opinions were divided among the judges about the “feeling of possession”, and comments were obtained that one of the reasons for this could be because they had not always experienced the intuitive change of layouts of the favorite images sufficiently due to the limited amount of qualification time.

Next, we took advantage of open campus to get various opinions from many users unfamiliar with VR contents. We summarized the feedbacks from about 180 high school students who visited the open campus and experienced GaZone. It was confirmed that nearly 90% of the participants enjoyed the system. Some participants talked with their friends after leaving the demonstration booth, saying “I felt happiness” and “I wanted to stay longer and more immersed.”

Finally, after securing about 15 minutes as experience time, we interviewed two students to obtain their impressions and to confirm the changes happening in the subject’s feelings after the experience. As a result, both users expressed that it was unrealistic and enjoyable about the immersive experience where they were surrounded by their favorite images. The user also noted that he felt he held the images by himself, and that the impression he got when looking at the images with GaZone was different from the one when looking at them with PCs or smartphones. It was observed that they were often surprised or felt joy in the process of freely moving images of favorite things with the controllers. That is considered to be one of the major factors that evokes the feelings of possession.

## 5 Conclusion

In this paper, we proposed GaZone, a VR system providing the feelings of happiness. GaZone focuses on the feelings of happiness that can be evoked when collecting and putting things that match with the users’ tastes around themselves, and reduces and eliminates the economic and spatial constraints associated with this behavior, respectively. In the evaluation experiment, users were asked to experience GaZone, and their opinions on the system and changes in feelings after the experience were collected. As a result, it was verified that the experience of GaZone actually evokes the feeling of happiness. In the future, we plan to improve the system so that the feelings of happiness can be evoked more surely, as well as to extend the function so that the feelings being evoked can be remembered continuously even after the experience.

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kind of approach was taken for that in the Entertainment Data Asset (EDA). The Qualification committee members judge the validity of the system’s approach based on the EDA and their experience using the system. [5].

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