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# Augmented Reality Media for Experiencing Worship Culture in Japanese Shrines

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**Abstract.** With the globalization in recent years, multicultural coexistence has been increasing its presence. This concept aims to create new relationships among people with different cultures through the acceptance of each other's cultural differences and values. In this study, we will clarify the method of realizing a media that conveys information about visiting shrines, such as the divine messengers, enshrined deities and manners, while emphasizing the acceptability of multi-generational users and the affinity with the installation space. The requirements were established through a survey, and to meet the requirements, a picture scroll was produced that included a screen to project the images and information to supplement those images. Users can put their hands on the images projected on the picture scrolls or place objects to get information about visiting the shrine. A questionnaire survey was conducted among the multigenerational users of the site, from the young to the elderly, to confirm the effectiveness of the experience of visiting the site, as well as their interest in etiquette and knowledge.

**Keywords:** Culture, Interaction, Media Art, Augmented Reality.

## 1 Introduction

With the globalization in recent years, multicultural coexistence [1] has been increasing its presence. This concept aims to create new relationships among people with different cultures through the acceptance of each other's cultural differences and values.

Among all Japanese cultures, those shrines located in the neighborhood are particularly playing important roles including the formation of regional communities and the sharing of intangible cultures in the region such as annual events like New Year's visit to a shrine (Hatsumoude). However, in recent years, there have been decreasing opportunities where we can gain knowledge about intangible cultures and the roles of a shrine which have been incorporated into our living practices and shared.

In this paper, we propose a scroll painting that delivers the intangible cultures concerning worship such as the divine messengers, enshrined deities and manners. We have, blending with the scroll painting, used image projections based on the recognition of objects and body motions. Worshipers and those concerned with the shrine have experienced the system installed at an actual shrine. The research results obtained through the discussions on the acceptability and effects of this system are detailed hereinafter.

## 2 Preliminary Surveys

We orally interviewed the people from shrines and Cultural Properties Department of the city government for the purpose of hearing their opinions about current worship and expression methods.

### 1) Worship Experience at Actual Site

The problem of decreasing number of people getting involved in shrines due to a declining birthrate was pointed out based on the interviews with the people concerned. In addition, there was a comment that it was not good to complete one's worship on the web. It is thought that their stances vary because some shrines and temples provide a virtual worship service.

### 2) Compatibility with Space for Installation

The answers include those such as "We have reduced the number of sign boards in our shrine because we respect its view"; "We would like you to give expression in a way not to change our essential parts" and "It would be nice if we can check the information on the traffic lines of worshippers through images, videos, etc."

### 3) Expression Drawing Attention of Many People

Some held the view that easy-to-understand expression methods such as images would be good as the ones that easily attract the attention of multigeneration worshippers including children and elderly people. Regarding the changes in expressions, we took home shrines (*kamidana*) as an example, and such comment as "Expression methods will change in accordance with today's housing environments like rental housing in which people are not allowed to install one with making a hole on the wall" told that even traditional things would change in line with the times.

## 3 Media Composition

### 3.1 Scroll Painting on Which Images are projected

As listed in design requirements 2, we, considering the compatibility with the space for Installation as well, employed a scroll painting made of Japanese paper (*washi*) (Figure 1/Figure 2). It was thought that there would be the compatibility with shrines since scroll paintings were one of the forms of Japanese paintings.

### 3.2 Information on Enshrined Deities

In this system, we gave expressions using the things relating to the enshrined deities appearing in myths such as A Record of Ancient Matters (*Kojiki*) and the images comprised of the names of enshrined deities (Figure 3). We chose, as the move to switch images, the body action of holding out a hand over the icon (Figure 4) with prioritizing the system manageability in consideration of the multigeneration people as our targets.

Further, we produced the animals as objects which are believed to be the messengers of enshrined deities. Placing such an object on the prescribed position, the information on the enshrined deity relating to the divine messenger expressed in the object will be displayed together with the special effects of clappers (*hyoshigi*) and drums (Figure 5).

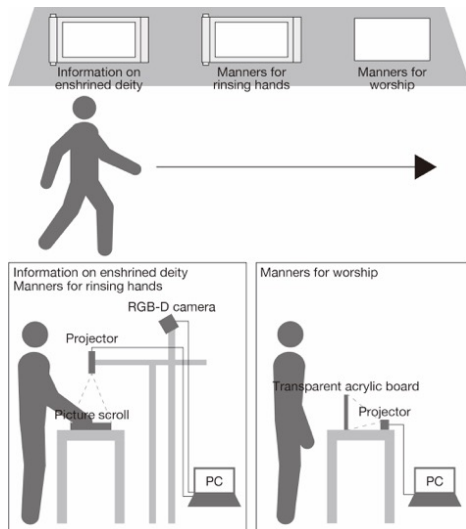


Fig.1. Overall view of work



Fig.2. Picture scroll

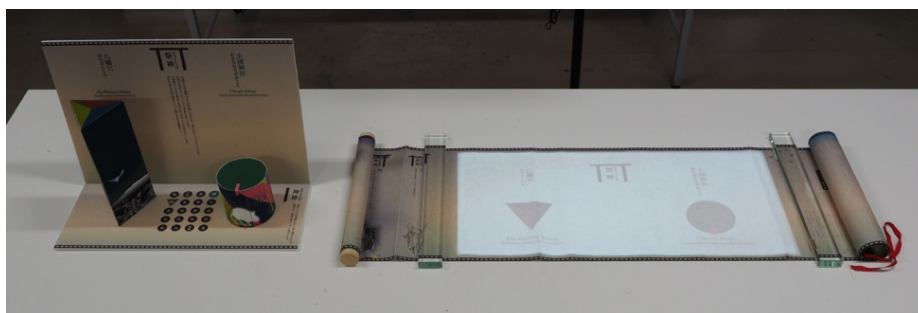


Fig.3. Objects of divine messengers and picture scroll on which images are projected



Fig.4. Holding out hand over icon

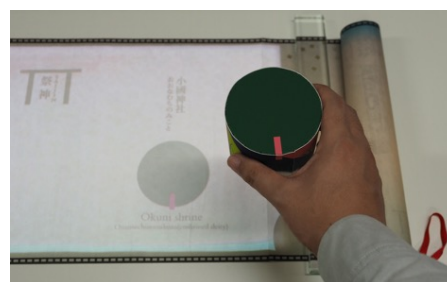


Fig.5. Placing object of divine messenger

### 3.3 Manners for Rinsing Hands and Worship

The manners for rinsing hands aim not to wash one's hands but purify them, which are the simplified version of the manners that used to be followed in sinking into a river,

the sea, etc. for expelling one's impurities. We considered that because manners were body actions after all, those who saw easy-to-understand animated images could get interested without being restricted by words (Figure 6). We introduced a seek bar to the animated images describing how to properly rinse hands for those who want to see them again and study them. The seek bar also enables those who don't have any knowledge on the manners to recognize their completion as it tells them when the animated images begin and when they end.

With regard to the manners for worship, we, using animated images likewise (Figure 7), show people the body actions of bowing twice, clapping hands twice and bowing once (*nihai-nihakusyu-ichihai*) which have been widely known. We project images by putting a film for image projection on the transparent acrylic board installed by the side of the scroll painting, which, in comparison with a normal screen, doesn't rupture spaces, makes visual expressions seen as if they were floating in the air, and enables one to feel mysterious, magical atmospheres.

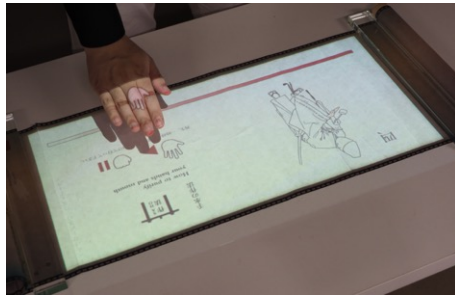


Fig.6. Manners for rinsing hands

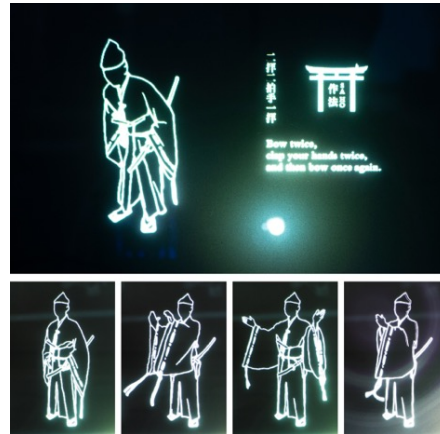


Fig.7. Manners for worship

### 3.4 System Implementation Method

For the purpose of the establishment of an evaluation system (Figure 8), we detected the bony framework of users using an RGB-D camera in the system to project and operate the images on the scroll painting in 3.2 and 3.3. With designating the coordinates of an icon projected on the scroll painting with a projector, we created a program by which the projected images are switched and special effects are played as soon as one's right hand or left hand covers such coordinates.

With regard to the recognition of the object of a divine messenger, we utilized a cascade classifier in order for the RGB-D camera to recognize the object. As for the manners for rinsing hands, we changed the start location of animated images by evenly divided ordinate for the operation of the seek bar. Regarding the projector, we chose a small mobile projector in order not to obstruct the detection of a user's bony framework and fixed it on the light stand (Figure 9).

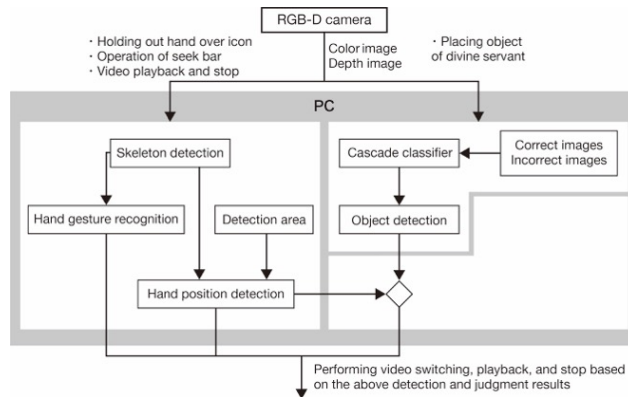


Fig.8. System configuration

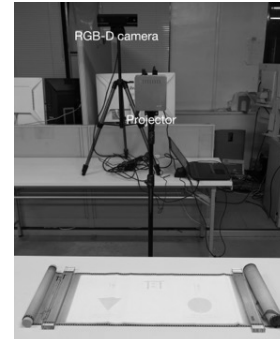


Fig.9. Equipment used

## 4 User Study in Shrine

In order to verify the effects of this system, we exhibited it from November 1, 2017 to November 7, 2017 at a shrine with an exhibition facility. We selected the exhibition facility in terms of the facts that it was on the traffic line of worshippers, that it was an indoor facility not to change the shrine's view with this system, and that it can secure the electric power source for the system and images.

For the purpose of confirming the necessity of the system dealing with a traditional subject as well as its acceptability and attractiveness enough to generate interests of worshippers, we requested 67 people with the age range from 2 to 60+ to use this system and interviewed 36 people among them (20 males and 16 females) In addition, we received comments and feedbacks from 2 people from the shrine.

### 4.1 Effects of Proposed Media

We, as a traditional method, created a system in which one can show on the display the same image as projected on the scroll painting and switch it with a click. Users were requested to operate it and give feedbacks in comparison with the proposed media. On the proposed system, one replied, "It is more interesting, rather than just watching the screen and clicking buttons for seeing things. I think this system is interesting because it requires us to produce movements such as holding out our hand and placing a thing, even for seeing the same things (a male in his 40's)". Concerning the display, one replied, "This is easier to operate. That one (proposed system) is a kind of difficult to understand for beginners... (a male in his 60's)", which showed that the traditional device had the advantage that it had an easy-to-understand operation system due to its popularization. Meanwhile, regarding the proposed system, one said, "This system has the property that we don't know what's going to happen next. That clicking this one (the pressure-sensitive touch trackpad of a notebook computer) to proceed is a usual move, isn't it? This system is interesting in that we don't know what's going to happen

by placing a thing (a male in his 40's)", which told us that one's inexperience in operation would awaken his/her interests.

#### **4.2 Compatibility with Spaces for Installation**

Some provided a comment that the materials and designs suitable to a subject were effective for the compatibility with the space for installation. "I think its design is good, matched with the places like a shrine or equivalents. I believe this is an important point (a male in his 30's)"; "The screen is so easily viewable, clear and well-made. Its layout is nice as well. It also produces a good atmosphere (a male in his 60's)" and "I guess a live-action video is too much as it would repeatedly play, for example, only this portion in which a person bows twice and claps the hands twice (*nihai-nihakusyu*), I mean visually. Displaying an actual human being is like.... This system will not make us tired that much. In terms of visual expressions as well, the simpler, the better (a person from the shrine)", all of which are examples giving a good evaluation to what we intended. Further, we received a comment such as "I have found it interesting. A scroll painting or the like produces a good atmosphere (a female in her 20's)".

#### **4.3 Acceptability of Multigeneration Worshippers**

Eighteen users equivalent to about half of them made a comment that the system was interesting. More specifically, they answered that they found the system interesting mainly because of its design, operation methods and special effects. Regarding the proposed system being an expression method with the use of the equipment including sensors and a PC, 13 people aged 60 or above also said that the proposed system was interesting and any negative feedback about the expression method itself was not given.

### **5 Summary and Future Development**

In this paper, we have discussed the design requirements and implementation methods of media that deliver the worship cultures in shrines. With installing the scroll painting in the shrine, we have, based on the feedbacks from multigeneration users from young people to elderly ones, confirmed several things including the effects caused through their worship experiences at the actual shrine site as well as their interests in manners and knowledge. In addition, it has been found that even those including elderly people are able to use an interactive experience system and feel it interesting. One of our future tasks is to validate the effectiveness of this system for non-Japanese people such as tourists from overseas.

#### **References**

1. UNESCO: Cultural diversity; <https://en.unesco.org/themes/education-sustainable-development/cultural-diversity>