Art Signboard To Raise People's Awareness of Disaster Prevention

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1. Introduction

People must always be prepared for disasters. Methods used for this purpose include creating posters to raise awareness of disaster preparedness [1]. In such cases, photos and videos of earthquakes and tsunamis are often used. However, exposure to photos and videos of disasters such as earthquakes and tsunamis can remind people who experienced disasters of their painful experiences and can easily evoke trauma in them [2][3].

2. Objectives

To address the problem described above, we can use a softer method to remind people of disasters in their daily lives and to make them more aware of disaster preparedness. Since art has the power to appeal to people's minds [4][5], art could be used to appeal to people's awareness of disaster prevention. This paper aims to describe the creation process of disaster prevention signboards using art and their installation so that many people can see them.

3. Methodology

3.1 "Sound of Ikebana" as art for disaster prevention

One of the authors, Naoko Tosa, has been creating video artwork called "Sound of Ikebana [6]," created by applying sound vibrations to a fluid such as paint and photographing it with a high-speed camera. The name comes from the fact that the forms of the jumping-up fluid look like Ikebana (Japanese flower arrangements). Figure 1 shows a scene from the artwork.

Fig. 1. A scene of the Sound of Ikebana

We have decided to use the Sound of Ikebana as art for disaster prevention signboards for the following reasons.

(1) The Sound of Ikebana is an art form that utilizes fluid phenomena and is strongly connected to tsunamis. Therefore, using the Sound of Ikebana as an artistic expression of tsunamis is reasonable.
(2) The Sound of Ikebana extracts and expresses the beauty hidden in nature and has the power to give people a feeling of "awe" and "relevance" instead of simple "fear."

3.2 Creation of art tsunami images using the Sound of Ikebana production method

We used the Sound of Ikebana production method to generate images and videos that express tsunamis artistically. We had the idea of using the sound of a tsunami to create the Sound of Ikebana. As it is difficult to record the actual sound of a tsunami, we decided to use the sound of a tsunami created by a simulated tsunami. The Disaster Prevention Research Institute, Kyoto University, has a tsunami simulator in the Ujigawa Open Laboratory. Using the sound of a simulated tsunami produced by this tsunami simulator, images, and videos with an artistic representation of tsunamis were generated. Two images were selected based on the generated images (Fig. 2). Using these images, two disaster prevention signboards were developed.

Fig. 2. Two images of artistic expression of tsunamis.

3.3 AR signboard using AR technology

In addition to still images, we decided to show videos on smartphones using AR (Augmented Reality) technology to appeal to people's emotions and raise their awareness of disaster prevention. A signboard was developed which has a unique AR marker (Fig. 3). The corresponding video is shown on a smartphone by reading the maker.

Fig. 3. An example of an AR marker

4. Actual Use of Disaster Prevention Signboards Using Art

4.1 Installation of disaster prevention signboards

The two signboards and one AR signboard were installed on the wall of the Ujigawa Open Laboratory (Fig. 4).

Fig. 4. Installed disaster prevention signboards.

The Ujigawa Open Laboratory wall faces the Keihan Railway (Fig. 5). The speed of trains passing these signboards is about 70 km/h. Since the disaster prevention and AR signboards are highly visible when passing by the Ujigawa Open Laboratory, they are likely to be seen by many passengers on Keihan trains, helping to instill disaster awareness in people consciously or subconsciously.

Fig. 5. Relationship between the disaster prevention signboards and the Keihan Line.

4.2 Testing AR signboard

Whether or not the AR marker on the AR signboard can be read by smartphones of actual moving train passengers and display the art tsunami video on their smartphones is an important issue for the appeal of this signboard. Therefore, we conducted a test to see if the AR marker could be read by passengers boarding a Keihan train and passing by the AR signboard. The result shows that if the camera is panned to follow the AR marker, the AR marker can be recognized precisely. Figure 6 shows how a disaster prevention video is displayed on a smartphone after recognizing the AR marker.

Fig. 6. An artistic tsunami video appears on a smartphone once the AR marker is read.

5. Conclusion and future work

We proposed a new way of using art for disaster prevention. One point to be considered in the future is to verify whether the proposed art-based disaster prevention signboard effectively raises people's awareness of disaster prevention.

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