

Chapter 25

Intangible Cultural Heritage and Communities

Field of expertise: Disaster Humanities

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Summary

Many festivals and folk performing arts were damaged by the Great East Japan Earthquake. The use of 3D measurement technology to record and compile a database of props used for the intangible cultural heritages will contribute to the early recovery of festivals and the reconstruction of local communities. In the future, it will be necessary to develop studies that contribute to disaster prevention from the same approach in the regions expected to be affected by the upcoming Nankai Trough Earthquake.

Keywords: intangible cultural heritage, festivals, SfM/MVS, 3D measurements, disaster humanities

Introduction

Since the Great East Japan Earthquake, the role of intangible cultural heritage such as festivals and folk performing arts in the recovery of local communities has attracted much attention. However, it often takes a long time to restore the props (the lion head, kagura masks, etc.) used in these types of festivals. How can the humanities, which have been studying festivals and folk performing arts, contribute to this?

1: Problems Revealed by the Great East Japan Earthquake

What happened?

In the Pacific coastal areas affected by the Great East Japan Earthquake, many unique festivals and folk performing arts have been identified. There are more than 1,000 in the three prefectures affected by the disaster, but many have been damaged. Shortly after the disaster, many people searched for props and costumes in the rubble because they expected festivals and folk performing arts to play a role in integrating the local community, confirming identity, and restoring daily life (Takakura, 2021). Recognizing this important role, researchers in the humanities and social sciences such as anthropology, folklore studies, and religious studies, as well as government officials, understood the disaster situation and supported local communities. In doing

so, we have been able to work on the early recovery of intangible cultural heritage (Takakura, 2016).

The reality of the damage

The damage caused by the disaster to intangible cultural heritage is wide-ranging. The loss of bearers and successors, loss of social opportunities such as not being able to secure places to perform and practice are serious. Though intangible, the loss of props, costumes, and musical instruments was a big part of the damage. In particular, damage to the lion head used in the lion dance and masks used in Kagura (Shinto theatrical dance) was a major issue. The original form of these props, which vary in shape and material depending on the community, were important to the local residents. However, before the disaster, not many villages kept detailed records of their dimensions (size, thickness, inner dimensions) and structures (material, weight, color, etc.) for restoration purposes. Restoration that relied on people's memories, and the repeated production of prototypes and revisions through interviews, have required a great deal of labor and time. In some areas, this resulted in a delay in the resumption of festivals and folk performing arts. In some cases, the delay in the restoration and reconstruction work even hindered the recovery of the communities.

2: Paradigms Destroyed by the Earthquake

Conventional wisdom and necessary responses

The reason why festivals and folk performing arts have maintained the continuity of local communities through the ages and generations is that props such as the lion head and kagura masks have been handed down as a constant reference point for the community, even though the bearers and performances have changed. However, detailed records of the dimensions and structures of these props have not been sufficiently maintained, as it required a great deal of time and effort to measure manually and record accurately. In addition, even if there are records in the form of photographs and videos, it is not easy to capture the three-dimensional shape of the props only with these records. In a disaster-prone country like Japan, where large-scale disasters such as the Nankai Trough Earthquake are expected in the future, if we can measure the form of the props used in intangible cultural heritage in a small amount of time and at low cost, we can create a database. This will make it possible to resume the intangible cultural heritage as soon as possible, even if they are damaged by a disaster. This will also help restore the local community as quickly as possible.

3: A New Approach

Based on the above issues brought to light by the Great East Japan Earthquake, a new approach to disaster humanities was developed, which is to contribute to the recovery of intangible cultural heritages using 3D measurement technology. In recent years, the development of research using 3D measurement technology has been remarkable, and there have been attempts to apply this technology to disaster research such as the reconstruction of damaged topography. The cost of equipment and software has decreased, and this new approach can be applied to the reconstruction of intangible cultural heritage.

For example, Fukuda (2019) studies the possibility and challenges of using two 3D measurement techniques, passive (Fig. 25-1) and active (Fig. 25-2, Fig. 25-3), to measure an object, the lion head. The purpose of this study was to determine the advantages and disadvantages of each technique by measuring a certain measurement target using different techniques and comparing the results. In the former passive measurement method (SfM/MVS), a large number of photos are taken with a digital camera, and the computer software calculates and processes this information, which enables relatively inexpensive 3D measurements. On the other hand, this took a long time to complete, there it resulted in a large volume of data. The latter type of active measurement can be performed in a short time, but installing a 3D scanner is expensive. There was no significant difference in data accuracy between the two methods as far as the purpose of restoration and reconstruction of the lion head was concerned. From this, it became clear that it is possible to measure the props of intangible cultural heritage with the above two methods in a short time and with a small amount of labor if the measurement object is 30 centimeters to 1 meter, such as the lion head or a kagura mask.



Figure 25-1. Passive 3D measurement



Figure 25-2. Active 3D measurement

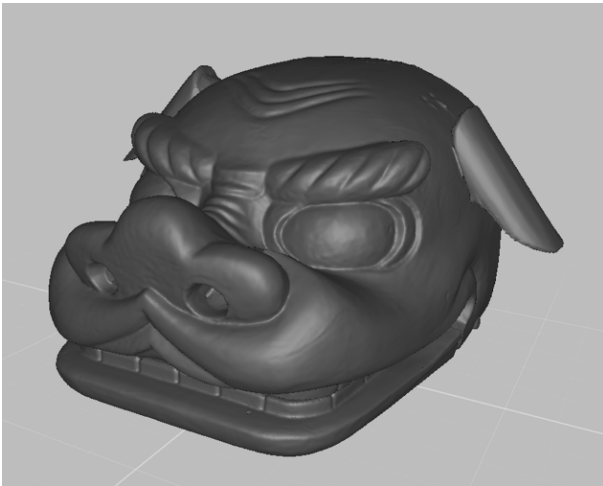


Figure 25-3. The lion head scanned by active 3D measurement

4: Achievements and the Future

A new approach to disaster science

Based on the results of the research described above, we are now conducting research to record props for intangible cultural heritage such as the lion head and kagura masks and to prepare 3D data. We are also working on the 3D measurements of larger structures used in festivals. In Wakayama Prefecture, which is expected to be affected by the Nankai Trough Earthquake, there is a festival in which small boats of 7 to 10 meters in length are used to go upstream in rivers and race in the sea. Some of the boats used in these rituals are difficult to repair even when we have a blueprint. We are currently working on 3D measurements and research projects for these boats.

Finally, we would like to describe the issues and possibilities of the 3D measurement research project of intangible cultural heritage. Regardless of which measurement method is used, there is much room for improvement in the 3D measurement of props and boats, such as improving basic measurement techniques and refining the processing methods. In addition, there is the issue of how to maintain the results of these 3D measurements as a database and how to make them available to the public. While there are these issues, there is also a great potential for this research. As mentioned above, by encouraging the early reopening of intangible cultural heritage, we can support the recovery of communities. This work makes it possible to compare the various tools and structures used in the festivals, and to trace how the festivals have propagated and gradually transformed. This research itself can be an opportunity for local communities to recognize the value of their own cultural heritage. In addition, this research has the potential for international comparison. Other disaster-prone countries that have a variety of intangible cultural heritage include Taiwan and Indonesia. Compared to tangible cultural heritages, 3D measurements of the tools used in intangible cultural heritages have hardly been conducted. In the future, it is expected that international joint research will contribute to the sharing of knowledge and experience, as well as to the protection of intangible cultural heritage.

Conclusion - from the authors

In this report, we have described the results and future prospects of my research on disaster humanities using 3D measurement technology. This research only just began in 2018. In the future, important findings and issues that need to be resolved will continue to be discovered through interdisciplinary joint research with researchers from various fields. Improvements in measurement technology, updates in processing software, and the way data is managed will also change. We would like to learn from various studies in the future and refine our own research.

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