

# Digital archive of the SHISHIMAI using AR Toolkit

Y. Watanabe<sup>1</sup> and H. Tsujiai<sup>2</sup>

<sup>1</sup>ARCGEO Inc, Japan

<sup>2</sup>University of Toyama, Japan

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## Abstract

*We made a digital archive of SHISHIMAI using an AR Toolkit. We used paper craft, using two markers for an AR toolkit to recreate the appearance of SHISHIMAI. We chose the SHISHIMAI of Toyama to archive digitally. Thus, we proposed a new use of AR technology. In addition, using AR, we created opportunities for the public to easily touch a lion mask used for traditional entertainment.*

Categories and Subject Descriptors (according to ACM CCS): I.3.3 [Computer Graphics]: Graphics systems and interfaces—Mixed / augmented reality

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## 1. Introduction

SHISHIMAI, the Japanese traditional lion dance, is performed by a man wearing a lion mask called a SHISHI-GASHIRA. Similar dances are also seen in China and Singapore. We produced 3D data of a lion mask used in SHISHIMAI. Furthermore, we used an AR Toolkit to create a digital archive of the data.

### 1.1. SHISHIMAI of Toyama

SHISHIMAI of Toyama, Japan, is rich in variation and it still has an inherited style in every region. Almost every Toyama lion mask is made by applying the traditional style [Yas12]. The lion mask handed down from the old days is Toyama prefecture's designated cultural property [Him11, TA90]. We believe that the Toyama SHISHIMAI also has digital-archive value as a cultural art asset.

### 1.2. New style of digital archive

A digital archive is data material held by a library or museum and used for data preservation; furthermore, it can be accessed through the internet [Tos12]. We used the AR Toolkit to make a digital archive system. Using AR, we can see the size of a digital collection on a human scale. Additionally, we can virtually exhibit a digital collection, such as a mask or accessories.

## 2. AR SHISHIMAI

This digital archive system uses the AR Toolkit. The interface also uses paper craft, which has two AR markers set as the upper and lower jaws of a lion mask. When the paper craft is placed in front of the camera, a lion mask is shown on the AR marker printed on the paper craft. As a player moves the paper craft, the virtual lion mask moves the same way, so the player can virtually experience the SHISHIMAI.

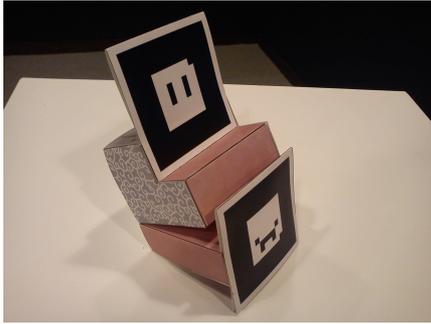
### 2.1. The interface of AR SHISHIMAI

We used paper craft that printed two AR Toolkit markers to AR SHISHIMAI. The paper craft's advantage is its low cost and ease of making spares. These features make setting up the digital archive system easy. Therefore, it is found to be a most useful interface [YA12a].

### 3. 3D scanning of the lion mask

To create 3D data on the digital archive for AR SHISHIMAI, we used a 3D laser scanner, specifically the DAVID LASER SCANNER [Dav14]. It scans shapes with a laser beam, using a camera and a calibration panel, scanning surface texture from the camera.

We scanned four lion masks, two in Habiro, Takaoka city, Toyama; one at the Futagami Imizu shrine, Toyama; and one in Futagami, Takaoka city, Toyama. We almost succeeded in scanning these lion masks' shapes entirely. However, we could not scan three masks perfectly. The lion mask in Habiro was newly printed and therefore glossy; however,

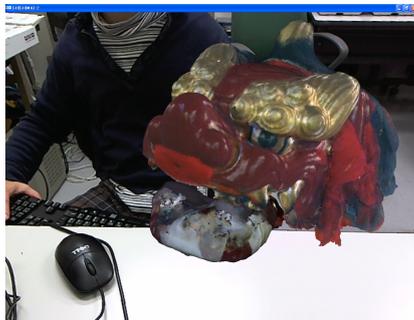


**Figure 1:** The interface of AR SHISHIMAI. Paper craft that printed the two AR Toolkit markers.

the scanning laser did not work well on the glossy surface. Finally, we did scan the lion mask's shape, but the data was of poor quality. The lion mask at the Futagami Imizu shrine has a black surface, which does not allow the laser to reflect well. Thus, it was also difficult to scan. The lion mask in Futagami, has both a black and glossy surface. Therefore, of the four masks the data was of the poorest quality in this mask.

#### 4. Exhibition of AR SHISHIMAI

We exhibited AR SHISHIMAI in the public gallery of Takaoka city, Toyama, and other places. Because visitors can hold a lion mask virtually, they become interested in SHISHIMAI.



**Figure 2:** We exhibited the lion mask in Habiro on AR SHISHIMAI. Although we could scan the lion mask's shape, it was of poor quality.

#### 5. Conclusion

AR SHISHIMAI is a new application field for AR technology. AR SHISHIMAI can make visitors virtually close to collections, and it is easy to set because we prepare just a PC, a camera, and printed paper. Digital AR archives are not limited to SHISHIMAI, the lion dance, but can be used for other collections like weapons or clothing. However, we

know many problems remain in 3D scanning and also in the system.

#### 6. Acknowledgments

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**Figure 3:** We exhibited AR SHISHIMAI in the public gallery of Takaoka city, Toyama [YH12b, Yuy13a, Yuy13b].

#### References

- [Yas12] Yasukazu Saeki, The phase of the folk customs of Toyama - Cooking, SHISHIMAI, Article of everyday use, Annual event, Gokayama, And so on : Toyama, Katsura bookshop, 2012(in Japanese) 1
- [Him11] Himi City Museum, SHISHIMAI special exhibition Himi -Danced SHISHIMAI and isn't danced SHISHIMAI- :Toyama, Katsura bookshop , 2011(investigated in 1983)(in Japanese) 1
- [TA90] Tadashi Nishimura and Akinori Katagishi, SHISHIMAI investigation in Fukumitsu Town: Toyama. Fukumitsu Shinkin Bank, 1990(in Japanese) 1
- [Tos12] Toshiaki Baba, Library information outline of resources JLA library and information science text Series III: Toyam, Japan Library Association, 2012(in Japanese) 1
- [YA12a] Y. Watanabe and H. Tsujiai, The Interface using two AR Toolkit markers: Chubu University. Joint Conference of Hokuriku Chapters of Electrical Societies (JHES2012). 2012(in Japanese) 1
- [Dav14] DAVID 3D Scanner, <http://www.david-laserscanner.jp/>, (We access on January 15, 2014.) 1
- [YH12b] Y.Watanabe and H. Tsujiai, Reappearance of SHISHIMAI using ARToolkit: Kunibiki Messe. Conference Proceedings of the 10th Asia Pacific Conference on Computer Human Interaction(APCHI2012), 719-750, 2012 2
- [Yuy13a] Y.Watanabe, AR-ization of SHISHIMAI: Geibungallery, Inseiten(Graduate student exhibition), January 31 - February 12, 2013(in Japanese) 2
- [Yuy13b] Y.Watanabe, AR SHISHIMAI:University of Toyama, University of Toyama and PATANASHIN university of arts exchange show, December 4 - 17, 2013 2

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