Virtual Yamahoko Parade in Virtual Kyoto

Woong Choi, Takahiro Fukumori, Kohei Furukawa,
Kozaburo Hachimura, Takanobu Nishiura, Keiji Yano
Ritsumeikan University in Japan*

Figure 1: *Virtual Yamahoko Parade. (a) Big crowds gather at Shijo Street, the city's main street, to watch this parade. (b), (c) and (d) are CG floats of Naginata-hoko, Fune-hoko, and Kitakannon-yama, respectively.*

1 Introduction

Recently, extensive research has been undertaken on digital archiving of cultural properties in the field of cultural heritage. These investigations have examined the processes of recording and preserving both tangible and intangible materials through the use of digital technologies.

For decades, tangible, material cultural heritage including archeological sites, and historical buildings and monuments has been digitally recorded. Compared to that, however, the intangible cultural heritage such as performing arts, theatre, social practices, and events, has rarely been regenerated in the virtual world [Furukawa et al. 2006].

In our research, we specifically focused on assets of Yamahoko parade in the Kyoto Gion Festival, which was added to the UNESCO's Representative List of the Intangible Cultural Heritage of Humanity in 2009. On July 17 of every year, this festival in Kyoto in central Japan culminates in a parade of *yamahoko*, floats known as 'moving museums' because of their elaborate decorations with centuries-old tapestries, wooden and metal ornaments. The festival is held by the Yasaka Shrine and the thirty-two floats are paraded by the residents of the city's self-governing districts. Approximately 150 thousands spectators gather to see the parade every year.

To reproduce Yamahoko parade in virtual environment, we generate a content that combines motion data of Yamahoko parade, spectetors and officials (*Hikikata*, *Ondotori*, *Kurumakata*) with visualizations of virtual Kyoto within a virtual world platform. However this research used only the well-known 4 floats out of thirty-two floats mentioned above and few spectetors compared to real parade are generated in virtual world.

2 Our Approach

The content of virtual Yamahoko parade includes CG floats of *yama* and *hoko*, crowd simulation, acoustics and Shijo Street of virtual Kyoto.

Four CG floats of Naginata-*hoko*, Kanko-*hoko*, Fune-*hoko*, and Kitakannon-*yama* were included in this virtual parade. These CG models of the floats were built based on our laser measurements of their miniatures, as well as surveyed drawings of the real ones which Kyoto City Tourism Bureau had made. Virtual Shijo Street is made by VRML data based on GIS [Yano, 2007]. A crowd simulation constitutes an important element to indicate how they are supposed to behave at the time of the parade in the Japanese cultural context. To create Japanese character models, we modified the models employed in "Vizard". The acoustics sound of parade was captured by multi-point measurement technique during the time of real parade. The mixing of sound effect controled the sound pressure level (SPL) of each instrument and optimized the SPL balance of the speaker based on CG content.

Vizard software enables us to create virtual Yamahoko parade in real time by integrating its assets. VRML data of Shijo Street, *yama* float and *hoko* floats were imported into Vizard to construct the streetscape of the parade. Character models with motion were transformed from 3ds MAX format into CAL3D format. These data were then used to generate the crowd simulation in Vizard. Approximately 730 characters were simulated in this virtual parade to make a realistic crowd behavior.

Figure 1 shows some examples of the content, elucidated on the above. We gained favorable comments from visitors at the exhibition of virtual Yamahoko parade held at the Museum of Kyoto in January 2010.

Acknowledgements

References

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*e-mail: wchoi@img.is.ritsumei.ac.jp