A Digital Archive System for Preserving Audio and Visual Space

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Abstract. A digital archive system has been widespread in various fields because it can preserve precious cultural heritage, books, pictures or videos without any deterioration. Moreover, preserving its information on the web, a digital archive system can share a lot of things between general users, and can pass them down new generation easily. In this research, we focus on spatial information of a place or an event which can provide high presence and retrieve personal memories, and develop a digital archive system which can preserve such kind of spatial information.

Keywords: Digital Archive, Omnidirectional image, Multi-channel audio, Spatial information.

1 Introduction

A digital archive system has been widespread in various fields because it can preserve historical and cultural heritage such as paintings, pictures or sculptures without any deterioration [1]-[4]. Moreover, by providing its data on the web, a digital archive system realizes to share a lot of things between general users, and pass them down next generation. However these digital archives, especially archives provided on the web are likely to be composed of a flat picture and stereo sound. As a result, users can not get as same reality or presence as real things.

In the field of Virtual Reality (VR), to solve this problem, some researches preserve historical heritage by high realistic way and display them by special display system. For example, Abe et. al. have preserved “Maijishan Grotto” in China by stereo camera and displayed them by stereo graphics [5].

In addition to such the research, not only precious historical heritage but also daily life of all around the world has been archived. For example, Watanabe et. al. have archived personal data of people in Tuvalu and reported daily life of Tuvalu where has suffered from sea surface elevation by global warming [6].

In the research of the digital archive of historical heritage, it is possible to preserve and display them in high realistic way. However such the system tends to need expensive equipments for measuring and displaying. Moreover, the high realistic
display tends to need large space for setting up and does not have mobility. As a result, only precious historical heritage can be archived in the system. On the other hand, in the research of the digital archive of daily life, it provides only photograph, video or text on the web. Therefore it is difficult to feel the reality of peoples’ daily life deeply.

In this research, we develop the digital archive system which provides high realistic information without any expensive equipments but mobile devices. In our system, archived data are provided from website, and which can display an omnidirectional image using WebGL and stereo sound using HTML 5. Users also can download the archived contents into our audio-visual display [7], and enjoy them in high realistic way. Moreover, for the archive system, we shoot some contents which are not historical heritage but personally or locally important scenery and space.

2 A Digital Archive System

2.1 System Overview

Our digital archive system is composed of two components (Fig.1). One is web system which provides archived contents. The other is spatial audio-visual display which realizes to reproduce downloaded contents.

Users can enjoy archived contents by the procedure below;

1. Users access our web site from local PC.
2. Selecting an archive from lists, and users preview it on the browser.
3. Downloading a preferred archive to local PC, and users set up archived data into our display system and enjoy them.

Server side of the web system generates a web page dynamically to client side. Client side realizes to preview and download contents and so on. The spatial audio-visual display is composed of head mount display (HMD) and multiple mobile devices, and which can reproduce downloaded contents by high realistic representation.

![Fig. 1. System Overview](image-url)