Abstract. We developed an all-around three-dimensional display system that enables projected images to be viewed from any angle. The effect is made possible by the projection of twenty-four images of an object, taken from twenty-four different angles, onto a spinning screen. Without the need for special glasses designed for three-dimensional image viewing, audiences can perceive projected images as real objects floating in space before them. The use of a special camera system in conjunction with the display system makes it possible to project images of real objects in real time. Furthermore, images captured by the camera system can be transmitted via a network. We continue to develop many kinds of applications in various fields as the Ubiquitous Display System.

1 Introduction

Desire to see 3D-Image as if a person or an object is there is appeared in many SF movies. However, it is nearly impossible to project volumetric images into aerial space with current technology, and it is hard to visualize distant objects as if they are at that place. As the first step toward realizing this dream, we have developed a novel approach for producing an all-around three-dimensional display system, which we can not touch, but we can view from 360 degrees.

2 How it works

The system requirements include only a screen with limited viewing angle, mirrors, and a projector. Images of an object from twenty-four angles are processed and broadcast from a projector on the device's base onto a mirror in its ceiling. They are reflected onto twenty-four mirrors that in turn, bounce them onto a rotating screen. The eyes of the viewer receive a slightly different point of view of the object without any special viewing glasses. Binocular stereo viewing is possible.

3 Real-time image transfer, and other applications

The images captured by the prototype camera system can be loaded into its projector directly and transmitted via a network in real-time to distant locations. This dis-
play system can show an unlimited variety of content such as computer graphics, and photographs. It can also be used for public displays attracting both business and entertainment opportunities. In addition, by using a sensor that can detect the approach of a person, interactive display systems are made possible. For example, if a person approaches the display system, an image of a character will turn to the person.

We are going to develop a proposal for the technology to be applied to a wide range of fields as a novel image representation and information delivery technique.