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MEDIA-ART EMPLOYING VIRTUAL SHADOWS WITH SHAPE RECOGNITION

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Abstract. *This paper proposes an interactive computer system which creates 'virtual shadows'. A shadow, a familiar physical phenomenon, is a media which has the shape and motion information of an object. The color of a shadow is usually black, and a shadow has almost the same shape and motion as its owner. If the shadow is colorful, and it has motion different from the owner, it might give us surprise and even fantastic impression, and might catch our attention. The developed system realizes such phenomena by using the technique of computer vision. A virtual shadow is created by a projector system employing the extraction of a human from camera images. The developed system performs image recognition. The posture of a person or the shape of an object is recognized, and various video effects are given to the virtual shadow based on the result of the recognition. By using the shape recognition method which has its own data base, a specific compound shape can be recognized, and it is possible to build various kinds of interaction in the system. The proposed technique may have application to entertainment or to advertising medium.*

Keywords: Media-art, Shape recognition, Virtual shadow, Projector-camera system

1. **Introduction.** There are various researches on augmented reality for realizing useful interactive systems. Augmented reality is a technology which combines or even overlaps the information created by computer with the real world. This technique is also paid attention as a novel tool for artistic expression. Recently lots of media-arts and amusement works have been proposed which employ the augmented reality technology [1-7]. The media-art is an artistic production which uses modern technologies such as computer, various sensors, and an internet. This field has developed rapidly these years according to the request on making our life more abundant.

A shadow provides a method of expressing existence of a person or objects in a space. The shadow can therefore be used potentially to various interactive systems and media-arts. In this research, we develop an interactive system which makes a virtual shadow by employing a camera, computer and a projector. The proposed method can provide a mysterious phenomenon which breaks common sense. For example, a colored shadow, a shadow with the shape different from its originated object, or a shadow having the motion different from the object.

There are some existing researches on interactive systems employing shadows. The researches [8,9] use a method which takes an image of a person with a camera and presents his/her shadow extracted from the image with a projector, then the created shadow is