

# Making Collaborative Interactive Art “Ohka Rambu”

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**Abstract.** This paper describes an environment for editing and performing interactive media art/entertainment. The design background is to provide artistic/entertainment pieces, in which multiple people can participate without special sensory equipment. This paper introduces a gesture input function using color tags in the image and some matching functions to be used for writing a piece. This paper shows an example of interactive media art/entertainment, called “Ohka Rambu,” and describes the usage and possibilities of the environment.

## 1 Introduction

Modern computer technologies on real-time gesture sensing and fast audio and visual rendering techniques have brought about a brand-new art genre called interactive art, and video games appealing to body sensation [1]. Nowadays, interactive art has become popular, and the number of galleries or artistic events featuring interactive art is increasing. Also body action games are very popular, especially for the young generation. The main stream of the game centers (arcade) has been changing to the gesture games. Interactive technology is one of the crucial keywords, when we think of new entertainment.

In this paper, we are going to describe one of the endeavors to realize interactive art/entertainment, in which plural participants can enjoy collaborative media performance. In Section 2, we introduce some related works and our design concept. Section 3 describes technical overview of the developed environment on which we edit and perform contents. In section 4, we present a concrete work called “Ohka Rambu,” implemented on the proposed environment. Finally we discuss the possibilities of the presented system.

## 2 Related Works and Design Concept

There have been many technological activities explored with the goal of assisting to edit (compose) interactive performances efficiently. These endeavors are mainly classified into one of the following three types; 1) authoring environment for multi-media, 2) media-rendering techniques, and 3) gesture information processing. In the research field of music, authoring environments for designing sound and music

have been developed since the 80's. We can find its developed form as a visual iconic authoring environment for multimedia, like a commercial product Max/msp [2]. Max/msp provides an interface to use external objects that third parties have developed. Currently, objects for computer graphics, video effects, and image sensors are available. There also are some activities to employ multiple sensors with some pattern matching functions for writing performing art for Max/msp [3, 4].

Rendering techniques and gesture acquisition are related to virtual reality technology. Recently, higher-level APIs for virtual reality have been open to the public. Among these open APIs, a free toolkit called ARToolkit [5] that supports image processing for object tracking is widely used for the implementation of virtual reality applications. Recently various high quality software video effect APIs are also available [6].

As mentioned above, we can choose and combine free tools as they may be fit for the intended design of the artistic/entertainment work. Although the freedom of editing interactive art/entertainment work is expanding, it is not useful enough, when we once set the concrete system configuration resulting from the artistic goal. Here, we focus on making interactive art/entertainment pieces, in which one or multiple audience members can participate without special sensors. In addition, we intended to edit a competitive mass game on the same environment. For this goal, we decided to design an environment for editing and performing interactive art/entertainment, which detects and reports movement of some color regions in video image, as shown in the following chapter.

### **3 System**

The system consists of a PC and video cameras. The main functions provided in the environment are movement detection of the given color regions and some feature extraction functions for the obtained movement. Processing flow from video image to movement calculation is shown in fig 1. We utilize color codes for identifying multiple gesture input.

The system captures the gravity of the registered color at the frame rate. Users of the environment may use similarity values between registered movements (template), as well as the time sequential gravity data. One of the points that we set in designing the system is to measure and utilize information regarding synchronicity of the participants to the works. Therefore we prepared for an API which reports the movement similarities of the selected two color regions. Combining these APIs, the content programmer can write cooperative and competitive contents efficiently.

### **4 Implementing “Ohka Rambu”**

We edited a Japanese-taste piece called “Ohka Rambu” (Dancing with Cherry blossoms) using the environment described in chapter 2. The artistic concept of “Ohka Rambu” is derived from typical Japanese spring scenery where plenty of petals of cherry blossoms are dancing fanned by a wind. In this piece, one or two

persons play by producing winds using blue and red paper fans. Some of the rules are implemented in a production system manner are:

1. For each fan, if a movement over a certain threshold has been detected, pedals falls down around the center of the fan, with ambient sound.
2. If fans stay at the same place for a while, a big cherry blossom emerges at the position of the fan. After the cherry blossom has fully grown and movement of the fan has been detected, plenty of pedals are blown up with a flash sound and imaging effect.
3. If the movement of two fans is synchronized, a motion blur effect emerges.

The image sample corresponding to the rules are shown in fig 2.

## 5 Concluding Remark

This paper has presented a framework that is intended to write interactive art/entertainment efficiently, and introduced a piece “Ohka Rambu” (Dancing with Cherry blossoms) edited on the framework. “Ohka Rambu” is supposed to demonstrate at any event including ICEC2005.

The system uses color markers for identifying gestures. Although participants of the have to wear or have colored markers, it is not a strong constraint compared with wearing the electric sensors. Moreover, this configuration allows many people to enjoy mass games. For instance, we implemented a preliminary mass game, in which the audience is divided into a blue team and a red team, having a blue penlight and a red penlight respectively. If each of the team members moves the penlight in the same way, we can detect this regularity from the gravity data. To the contrary, if the team members move the penlight at random, the gravity data does not produce meaningful data. We used this constraint in implementing the mass game.

We would like to demonstrate the system together with the media piece “Ohka Rambu,” at some events, including the ICEC2005. We would like to gather comments from participants who experienced “Ohka Rambu”, for evaluating the system and piece as future work.

## References

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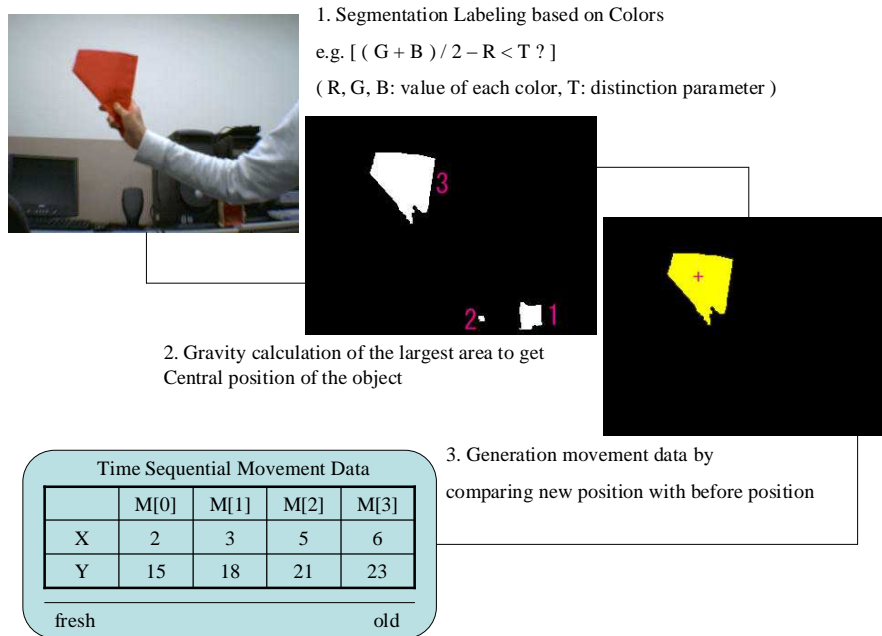


Fig. 1. System Configuration. Data input and getting raw movement data

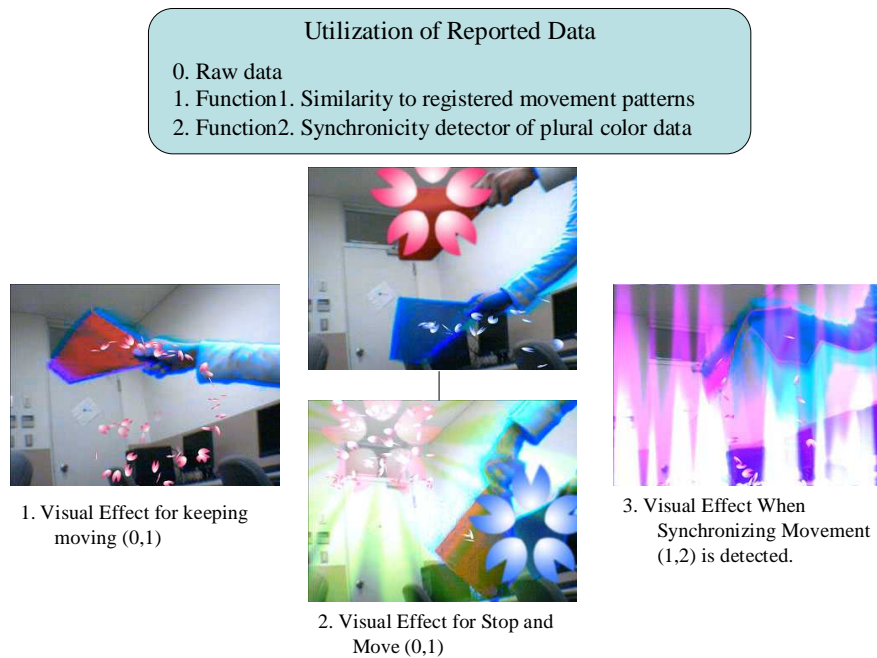


Fig. 2. Some pictures of "Ohka-Rambu"