The Group Jump Rope Orchestra: an interactive system to present a sense of togetherness

Ayaka Sato
Ochanomizu University
2-1-1
Otsuka,Bunkyo,Tokyo,Japan
ayaka.sato@is.ocha.ac.jp

Anna Yokokubo
Ochanomizu University
2-1-1
Otsuka,Bunkyo,Tokyo,Japan
anna.yokokubo@
is.ocha.ac.jp

Itiro Siio
Ochanomizu University
2-1-1
Otsuka,Bunkyo,Tokyo,Japan
siio@acm.org

ABSTRACT

"The Group Jump Rope Orchestra" is an interactive system to present a sense of togetherness of participants by using a virtual reality technology. Participants of this system can perform an orchestra music by jumping a virtual rope that is projected onto their front screen and onto the floor. As the number of participants increases, the orchestra becomes grander.

Keywords

jump rope, orchestra, interactive art, virtual environments

1. INTRODUCTION

A group jump rope is a sport that several people jump into a long rope one by one and jump together. As the number of participants increases, it gets more difficult to jump continuously. To succeed in the group jump rope, participants need to synchronize their timing and rhythm. When they synchronize, participants will feel a sense of togetherness, and this is one of the pleasantness of a group jump rope. Similarly, an orchestra perform a music with several people play instruments together. Also, orchestra is familiar to all over the world and is often used in interactive systems[1]. We propose an interactive system by mixing a group jump rope and an orchestra together, so that participants can feel a sense of togetherness with their sense of vision, hearing and their whole body.

2. SYSTEM OVERVIEW

This system consists of two projectors, projecting on to the front screen and on to the floor, and lasers and photo diodes to judge whether participants jump correctly(see Figure 1). The front screen is projected from the back, and a short focus projector is used to project on to the floor, so that participants' shadows will not be in the way. Photo diodes are connected to a computer via an USB I/O module. These determine whether each participant has jumped over the
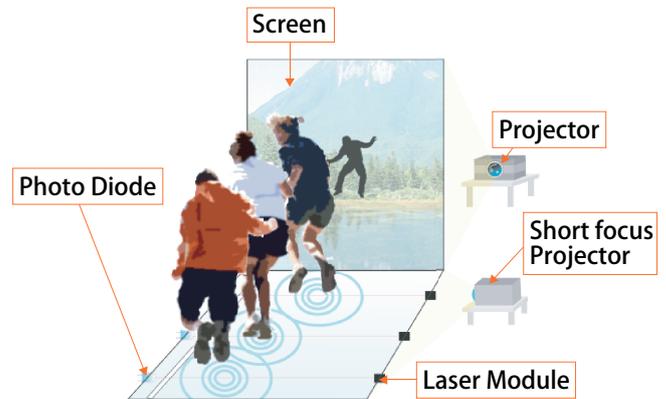

Figure 1: System overview.

virtual rope or not. Due to the determination, music and projected image will change.

At the front screen, viewed from participants, images of the swinging rope and the person who is swinging the rope are projected. On the floor, the image of the rope that the movement linked to the front screen is projected. When an participant jump into the virtual rope projected on the floor, and jump correctly, one part of the orchestra, for example a violin's melody flows. At the same time, images of ripples caused by participants' jumps are shown on the floor. When another participant joins and both participants jump correctly, another part of the orchestra, for example a trumpet's melody flows together with the violin's. So, the more participants jump into the rope, the grander the orchestra becomes. When someone is caught in the rope, which means that when someone couldn't jump at the right timing, a dissonance will be played and the music stops. There are various music and images that will be projected onto the screens, so that participants can enjoy various patterns.

3. REFERENCES

[1] Roberto Dillon, Gabriyel Wong and Ron Ang. Virtual Orchestra: an immersive computer game for fun and education. Proceedings of the 2006 international conference on Game research and development, 2006.