Yadori: Mask-type User Interface for Manipulation of Puppets

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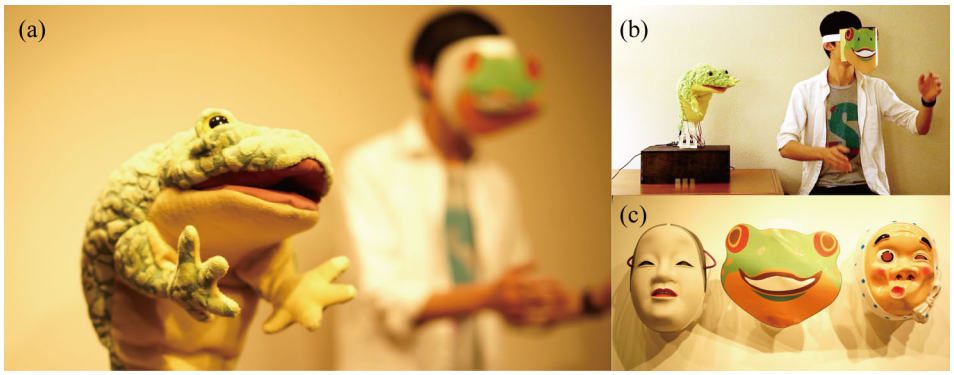

Figure 1: *(a) Application image of our system. (b) Puppet synchronized with performer's movements. (c) Masks of several characters.*

1 Introduction

We propose a system for animatronics storytelling that enables performers to manipulate puppets by wearing a mask-type device on their faces.

There have been several studies on devices for sensing facial movements. For example, Affectivewear [Masai et al. 2015] captures user's eyes movements with glasses device. However, mask-type device for sensing facial movements has not been focused on.

In Japanese theatrical arts, there is a cultural show called "Noh" where the actors cover their faces with special masks, and act to music to convey a story. Wearing a mask of certain character help Noh-actors to play the role in the story as if they were the character. In puppetry, performers manipulate puppets using their hands above the desk while rest of the body is below the desk. This poses a challenge in coordination of actions mostly so if there are multiple actors. Mask-type device for animatronics is new user interface that allows users to manipulate puppets more easily and intuitively since they are manipulated in accordance with the movements of the performer's face and mouth. It facilitates coordination of movements to appear more natural since the actors are relaxed and in direct eye contact with each other. Performers can wear a mask of any character on their faces that they want to manipulate. It allows performers to be excited in manipulating puppets and get right into their own part.

Keywords: puppetry, mask, robotics, manipulator

Concepts: •**Applied computing** → **Performing arts;**

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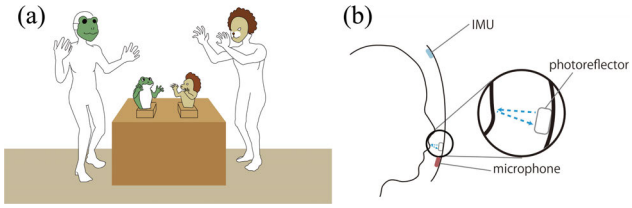

Figure 2: *(a) System image of Yadori. (b) Design inside our mask-type device.*

2 Implementation

Our mask-type device captures voices and facial movements. Inside the mask-device, we have a microphone to record performer's voices, photo reflector that detects the different states of opening and closing of performer's mouth and an IMU that captures the direction of performer's face. As an additional function, we use Kinect depth-camera to capture movements of user's hands. This is motivated by [Aravind et al. 2015] that manipulates a puppet with motion capture. Our system combines these body and facial movements to manipulate puppets toward supporting smooth synchronization between performers and puppets in puppet play. Our system uses Bluetooth module so that the information captured by sensors is sent to computer to manipulate puppet computer wirelessly.

References

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