

# Virtual impersonation using interactive glove puppets

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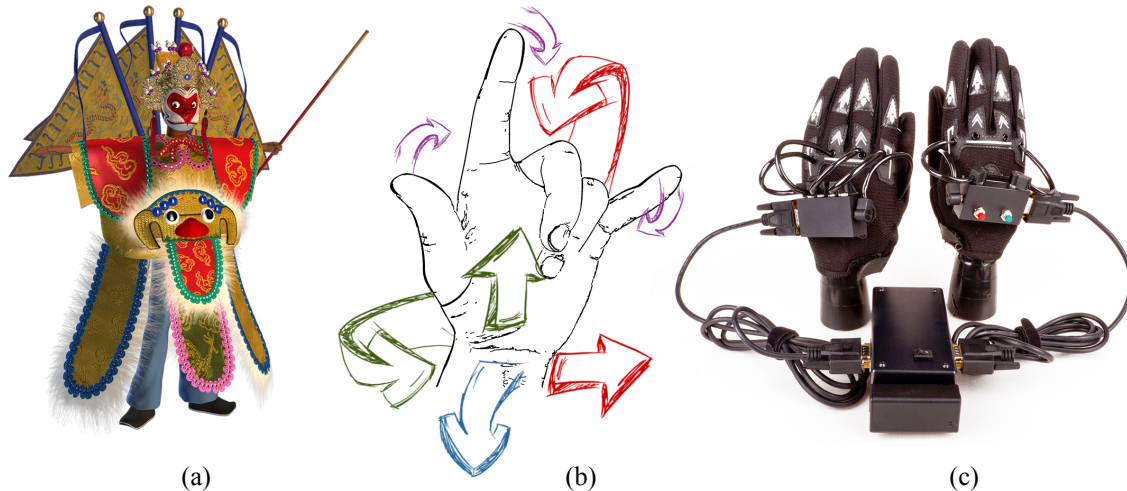


Figure 1: (a) 3D puppet – digital double, (b) hand motion: rotation, translation, fingers, (c) interactive gloves

## Abstract

The foundation of this project was an artistic investigation of traditional glove puppetry and hand gestures used for storytelling. To tell stories in a different way and to mimic the impersonation of a costumed human hand we use 3D technology, analog and digital sensors and computer vision with Kinect to create a connection between the puppeteer and a virtual puppet.

**Keywords:** interactive puppetry, 3D animation, performance interface

## Introduction

The key difference between a 3D animated character and a real-time puppet is the way how they become alive. Animation is a background process and the animator “educates” the character through various stages from the design to the rigging. An animated character will accept all input and submit to the willpower of the creative spirit of the animator. The physical puppet on the other hand develops an organic unity with the puppeteer who grants humanity to it using his or her hands. While the puppet completely depends on the human body, it’s crafted identity only participates in a performance creating dual existence with the puppeteer and unlike in animation the puppet will educate the human. This work presents a digital double of a physical puppet that is controlled by a performance interface designed specifically for glove puppets.

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## Method

In order to create sensitive and precise tracking of the wrist rotation we placed an inertial measurement unit on the right hand glove. The right hand position is tracked using the Kinect sensor. The fingers are tracked using flex sensors inside the gloves. All readings are calibrated and mapped to a specially designed character rig inside Autodesk Maya software. The puppeteer is free to choose a default pose of the wrist and calibrate sending a command directly from the glove. The motion can be captured into keyframes at any stage.

The result of this project showed the potential of this method to create 3d rendered films using real time 3d puppets and interactive virtual performance.

## References

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