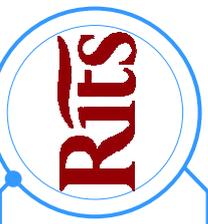


RealSound Interaction

A Novel Interaction Method Using Sound Events in Real World

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Introduction

- Mixed Reality (MR)
MR merges real and virtual worlds in real time

Example of MR attraction

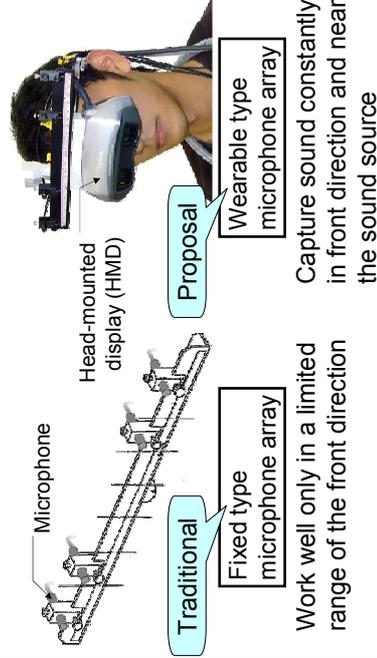


- RealSound Interaction
- Sound events in the real world is used as **interaction** or **input devices** with an MR space
- Easy to keep proper mental model using familiar sound sources

↑ Realize an intuitive operation

- Detecting the direction and location of a variety of sound events by **microphone arrays**
- Using them for more general interactive operations

↑ Develop a general-purpose system for various applications



Interaction methods using sound event

- Using direction of sound event

Menu selection

The user can select the menu item by generating a sound toward it

Sound source



Computer-generated menu item

Direction indication

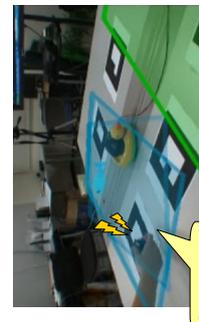


Sound source (mobile phone)

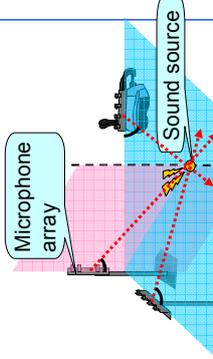
Virtual object superimposed at the direction of sound source

- Using location of sound event

Menu selection



Selected!



Microphone array

Direction of sound source

Pointing operation



Clap!



Clap!

Application

- Watch the Birdie! ♣ ♠ ♦

MR attraction using the sound of birdcall

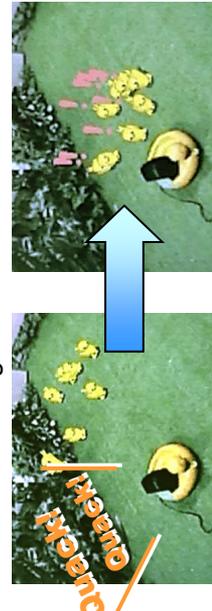


Birdcall
A devi
generating a bird-
like imitated sound

Selected!

The birds fly from the direction of birdcall

Mother duck (a real toy with a speaker) squawks and virtual ducklings run toward her

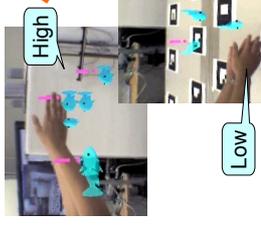


Quack!

- Come & play! ♠ ♡ ♦

Using 3D sound localization, the users can gather virtual fish swimming in the 3D space by handclap

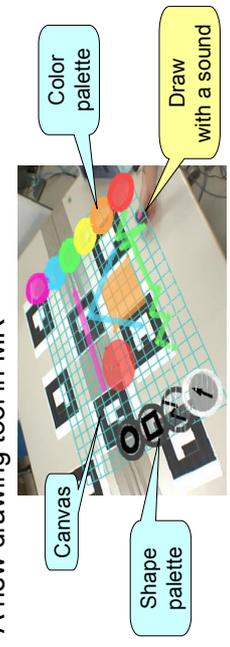
High
Low



Future work...
Multipoint recognition using different sounds

- Acousticlink ♠ ♡ ♦

A new drawing tool in MR



Canvas

Color palette

Shape palette

Draw with a sound