

A Multiuser Communication Environment with High Sense of Presence in the Next Generation Home Network

Dai Hanawa, Akira Kohno,
Shingo Yamakawa, Shohei Terada,
Kimio Oguchi
Seikei University.

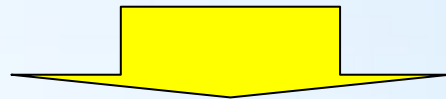
1. Introduction

- Spread of broadband access networks
- Use of big capacity and high quality communication media
- Real-time interaction using various communication media via the networks

2. Objectives

Our laboratory's theme

What the next generation home network (NGHN) should be like



Construction of a multiuser communication environment for the NGHN

- A framework of communication with high sense of presence
- Requirement for the system design
- Clarification of the technical issues

3. How can we use the NGHN ?

- ▶ Network service using high quality communication media.

End devices for input

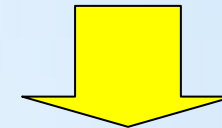
Keyboard Mouse Web camera
Microphone Game controller



High quality video camera
Sensors located in a room or human

Display devices

PC monitor TV monitor
Screen



Large size
High resolution

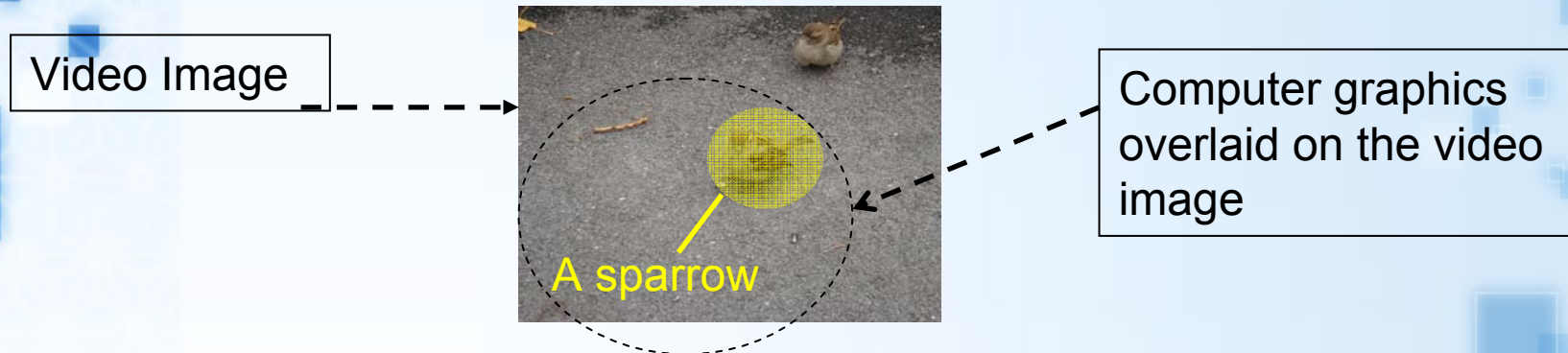
How did we design a framework of our system ?

4. A framework of our proposal

Basic concept is
Networked *Mixed Reality* System.

What is *Mixed Reality*?

▶ Technique for combination of video images as a real object and computer graphics as a virtual object.



5. What is advantage ?

System offers ...

➤ High sense of presence

- High quality video image
- Man size screen
- Useful data is overlays on video images as CG

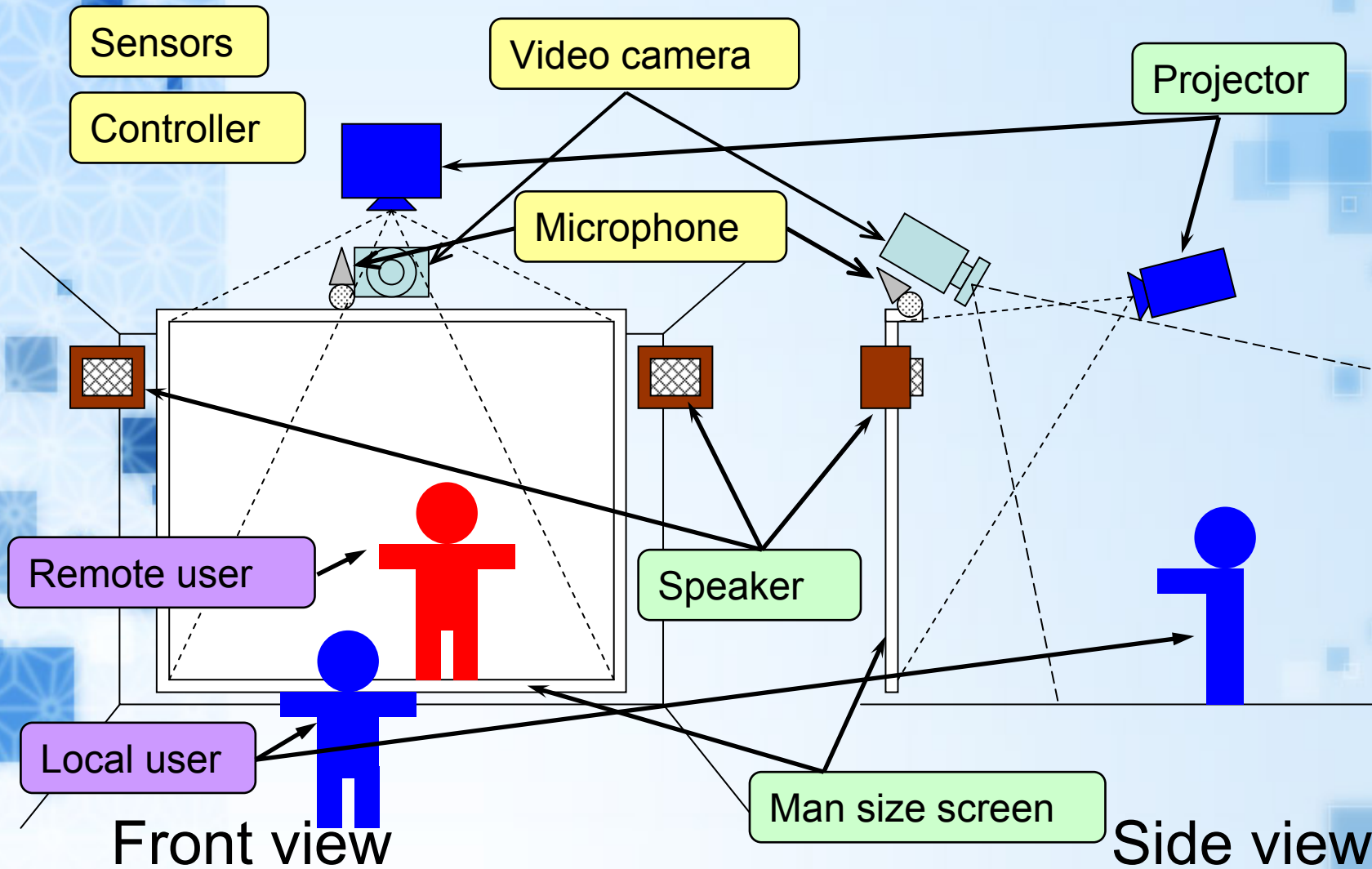
➤ Real-time and interactive communication

- Sufficiently small transmission lag
- Sufficiently short time interval for information updating

➤ Application

- Collaborative learning
- Network game using a physical motion, etc.

6. A structure of a system in a room



7. What are technical issues ?

In order to achieve

- High sense of presence
- Real-time interactivity

Two main issues

- Spatial concern
 - Screen size
 - Resolution of an image
- Temporal attributes
 - Limitation in transmission lag
 - Limitation in update interval

8. Summary

- Proposal of a multiuser communication environment based with high sense of presence for the NGHN
- Design of a framework using networked mixed reality techniques
- Analysis of requirements for the system
- Clarification of technical issues which should be solved

9. Future works

- Construction of a test bed for evaluation of feasibility
- Implementation of applications for the case study
 - Remote collaboration learning environment
 - Network game contents
- Evaluation of the performance