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SmallConnection: Designing of Tangible Communication Media over Networks

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ABSTRACT
The concept of "SmallConnection (abbr. SC)" is creating easy to operate tangible media for communication over networks. Focusing on the scenario where two intimate people live in distant places, we developed communication media that can be handled like tools, and can convey faint information such as light, wind and touch through the use of a robot technology. The goal of this project is to propose and prototype new media design for communication between two people. Through working 3 products derived from SC, we hope to widely propose a future communication design using multimedia.

Categories and Subject Descriptors
H.5.2 [**Information Systems**]: Information Interfaces and Presentation (e.g., HCI) User Interfaces– *Prototyping, Theory and methods*

General Terms
Design

Keywords
Ambient media, communication, tangible interfaces, intimate technology, robot technology

1.1 BASIC IDEAS OF SmallConneciton
SC consists of three core ideas.

1. SC is a private communication media between two people. It is not meant for discovering new relationships, but focuses on enriching existing ones.

2. We design user interface for SC so it can be handled like a tool. It blends in with its environment like the tools we use everyday.

3. SC can be used to convey moods, presence and atmosphere. It can be used to communicate casual feelings that may seem too insignificant to convey with other media.

2. RELATED WORK
Following the flow set by the Tangible Bits Project [1], Ambient Devices Corporation manufactured information devices as products. Those products provide interfaces between people and information making use of experience from Tangible Bits.

The research viewpoint how to communicate with intimates is discussed and prototyped over a wide range. SC appears similar to LumiTouch[2] in communication media between intimate relationships. In the way to design of communicating intimacy one bit, our project is related to Joseph 'Jofish' Kaye's [3] viewpoints.

SC proposes not a new interface between human and computer but a new concept and development environments that users can freely design and choose tangible communication media for intimate relationships using robot technologies.

3. PROPOSAL MODELS

3.1 Model 1: air
"air" communicates a feeling of presence to a distant partner through light. "air" consists of two pairs of blue and red lamps connected over a network. One person controls the blue lamp and the other, the red lamp. When a colored lamp is turned on at one end, the same color lamp on the other end is also turned on. In the same way, the lamp can be turned off.

Figure 1: air.

3.2 Model 2: anemo
"anemo" is a wind tunnel connecting to spaces. The activity in each space changes in to wind and blows into the other room, turning a propeller. An "anemo" is placed in two distant locations.

"anemo" detects sounds within a room and triggers its counterpart's propeller to spin. "anemo" spins in sync with conversation or music in the other room. As the sounds grow louder, "anemo" spins faster.

Figure 2: anemo.

3.3 Model 3: one

"one" is a sphere split in half. Two rods stick out from the center of "one", which can be pushed in and out to communicate a sense of touch. Two distant people each have a "one". When the center rod is pushed in at one end, the rod on the other end moves up. If the rod is pulled out, the other moves down.

Figure 3: one.

4. IMPLEMENTATION

Technology using sensors, actuators, control technology, and network technology are often called RT [4], or Robot Technology. Here, we use the term "Robot" not to refer to mobile robots, or humanoid robots, but as a generic term referring to an intelligent system that operates on real world environment using sensors, actuators, control technology, and network technology. Therefore, we can call a device in a living environment dispersed with sensors and actuators that cooperate together to act and react with people, an RT device. In this project, we propose a middleware, called RT middleware, which simplifies the use of Robot Technology which used to require technical expertise. RT middleware is a platform that allows simplified application software development of cooperative network RT devices.

For the development of SmallConnection, we created a unit called RTUnit which is a set of digital IO, AD converters, a PIC microcomputer, and a network interface. We used RT middleware in the application layer which controls SmallConnection devices based on RTUnit.

By using RT middleware, users that are not familiar with developing hardware can create products combining IO interfaces provided by RTUnit at a software level.
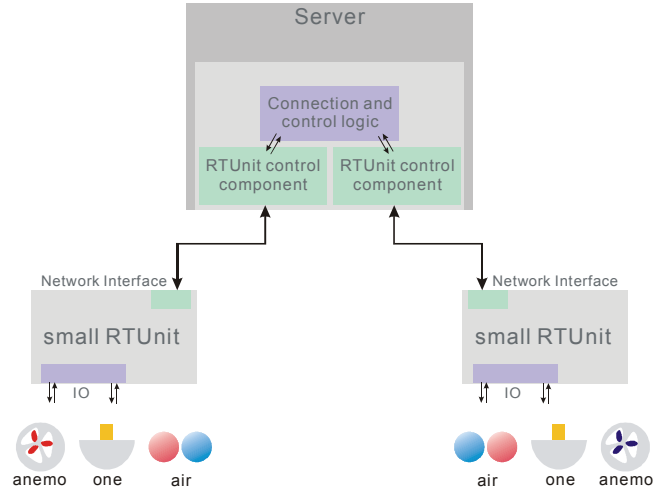

Figure 4: System Setup of SmallConnection.

5. CONCLUSION AND FUTURE WORK

The greatest innovation in our study is that SC was able to expand the diversity of future communication media. Where as previous communication media were mainly based on visual and audio, our project expands the breadth of communication by communicating casual moods, feeling, presence, and atmosphere. In the future people will be able to select the styles of communication which best fits the content of what they wish to convey.

Finally, we started a new project running in parallel to SC called "OpenConnection". Where SC focused on scenarios for private communication, "OpenConnection" will propose new directions in communication and retrieving information for public spaces.

6. REFERENCES

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new technologies and conceptual approaches into novel artistic ideas

that provide new perspectives on the notions of

absence and presence.

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