Proposal and Evaluation of System to Connect People in a Distant Place

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Abstract

Our proposed system is the ambient computing system which helps people who are in a distant place to communicate with each other. The system translates the entropy of the state of the desk which shows the state of user's mind into the visual art contents. In practice, we got the data of the entropy of people's desk and then investigated the usage of the data. Furthermore we showed other people the visual art contents and investigated their feelings. By our system, we knew that they did emotional interaction. We hope that our system reduces loneliness and worries of people who live alone.

Introduction

Today there are various ways to connect with people who are in a distant place such as telephones, e-mails and chat. However, phones and chat occupy our time. E-mail is composed of just words, so we cannot know their true feeling through them. We can even tell a lie with e-mails! For these reasons existing ways to communicate is not enough for communication to reduce loneliness and worries of people who live alone. To solve this situation, we suggest our ambient system which we named as Pelicomm.

We expect that Pelicomm brings the users about the emotional interaction. Emotion is interactive. Negative and positive emotion should be shared between all members in face-to-face communication. However, in the computing and networking era, human computer interaction enables to do emotional interaction between the people who are in a distant place. Therefore, we focus on the design of the emotional interactive system. What is the most important is to consider other people.

We need to know the state of others' mind to consider them. We believe that the entropy of the desk shows the states of user's mind. This idea is based on some scenes of cartoons and animations. Have you ever thought that the states of the desk in some scenes link to the states of character's mind? For this reason, we started to collect the data of the desk.

However there is a problem. Some people may be reluctant by being collected the data of the desk. They may think this is an invasion of their privacy. Thus Pelicomm

should be fit in our environment and we can use it without hesitation; it means Pelicomm should be ambient computing system.
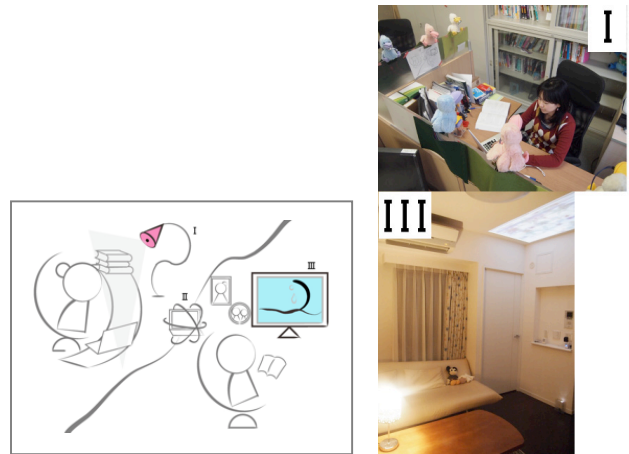
Pelicomm: System to Connect Distant People

Fig. 1 The image of Pelicomm   Fig. 2 Overview of Pelicomm

Fig. 1 shows the image of Pelicomm and Fig. 2 shows the overview. We call the people who are in their working space (I) "Watched people" and other people who are in their living space(III) "Watching people." They are in a distance. In the working space the states of the Watched people's desk are collected by some sensors which include in stuffed pelicans. These data will be sent to a living room via the internet (II). The Watching people casually see the visual art contents which are made by the data of the desk. Seeing the visual art contents stimulates the Watching people to consider the Watched people. With noticing the mind of the Watched people, the Watching people try to take thoughtful action to the Watched people. When the Watched people receive the action from the Watching people, they will feel something new and this feeling will influence their next action. We think, as it were, Pelicomm brings about emotional interaction between users.

Contents

The Watching people see our visual art contents. For the following questionnaire we made them which show the pattern of a section of water. In other words, the theme of

contents is "water." Could you guess why we chose "water" as our theme? I think you have experienced the following situation.
--- *When we see a calm ocean, we become composed. On the other hand, when we see a rough ocean, we feel unease. Therefore the states of an ocean influence our minds.* ---- Furthermore we think the contents should be unusual; otherwise, the system becomes intentional. For these reasons, our contents show the sections of water. Fig.2 is one of them.
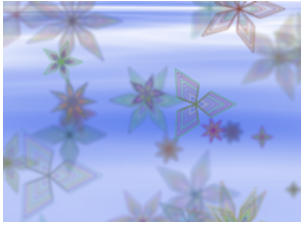

Fig. 2 One of the visual art contents

Before discussing our visual art contents to subjects, we think about a transition state of a desk. Then we think the states of minds. (Fig. 3)
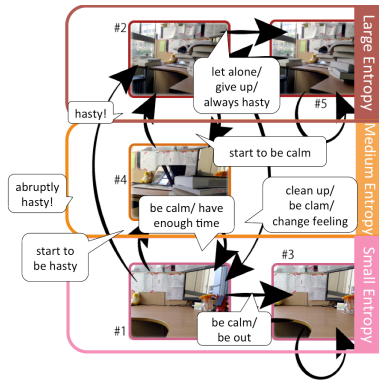

Fig. 3 A transition state of a desk
and mapping of the state of minds

At this time, we focus on the nodes of the transition. Therefore we use static images in the following questionnaire.

Experiment and Questionnaire

We investigated three points.
• If the data of the desk is useful for Pelicomm.
• If our mapping about the states of a desk and the states of minds whose can be grasped from our visual art contents is correct.
• By using Pelicomm what emotional interaction does expect between the users.

In this experiment we collected the data of the desk by the ultrasonic distance sensors inside the stuffed pelicans. Two sensors include one stuffed pelican. Six sensors are connected to one Arduino. Arduino ecpresses the depth data from sensors on our PC. Considering the directivity of the sensor and my working space, we knew that it was enough to twelve sensors to measure whole surface of my desk.

In this questionnaire, 40 people answered some questions about our contents by their free descriptions. We analyzed these answers. First we investigated if our mapping about the states of a desk and mind is correct. We made the visual contents with a positive image or a negative image, so we classified the answers into a positive answer or a negative answer. As a result, our expectation matches the answers except the one of them. We expect that this image is positive, because the entropy does not increase for a while. Thus we suppose that the watched people are not in the working space or have enough time. According to the answers, for the student subject most answers are positive, on the other hand, for the teacher subject most answers are negative. About these results, we think it also makes sense, yet the result is different from our exception, because for a teacher it is not a good state that she has enough time and does nothing. Most teachers should be busy, people think. Overall, we could say that our matching remains true.

Next, we investigated what emotional interaction they did. We showed the anonymous answers to the two subjects: the student and the teacher. With only the answers they can know if the respondents have consideration. Furthermore, with action, we can do more natural emotional interaction.

Conclusion

We proposed an ambient system, Pelicomm, which helps our communication in a distant place. In our experiment we got the data of the desk with the ultrasonic distance sensors and translated it into the visual art contents. Then we try to investigate how Pelicomm works to help communication by the questionnaire. As a result, we say that Pelicomm stimulates to consider the other people and makes users interact emotionally without consciousness.

The important prospects of Pelicomm are to upgrade the visual art contents, to investigate how users interact emotionally by them, and to link them to the depth data. Recently with the growth of the technology we will live with the walls which are made by thin displays. This growth will match our ambient system. We strongly hope that Pelicomm decrease the loneliness and worries from people who live alone.

References

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