Situation-based Robot Design

Seita Koike   Musashi Institute of Technology

Kohei Osawa   Musashi Institute of Technology   graduate school

Shuntaro Kon   SKI Corporation

Miho Takahashi   Nihondataskill Corporation

1. About koike information design lab.

At Koike Information design lab of Musashi Institute of Technology in Japan, we are doing user-side design. We survey user's activity and have designed a bus map, car parking signs at the ward office, robots and user information equipment interface.

2. About Personal Robot

We design the performance of the robot with Partner-type Personal Robot（PaPeRo）developed by NEC Corporation. We use PaPeRo as a tool of our research. the development environment   of   the robot makes it easy to develop   the robot 's action. We use the development environment to develop original software for the robot.

PaPeRo's more information : http://www.incx.nec.co.jp/robot/english/robotcenter_e.html

Fig. 1 Partner-type Personal Robot（PaPeRo）

3. Use of the robot and fieldwork at a nursery school

We designed an original program for the robot and took it to a nursery school in Tokyo. We   incorporated the opinions of   children, parents and teachers   to the robot's software. Experimental period lasted from October 1995 to December 1995. We

remote-controlled the robot using PDA.

There is a commonly used method for robot design that verify the performance of a robot as assumed by designer. But we used the robot in user's activity at the nursery school and observed it and evaluated what action of the robot to design   situation by situation as follows.

Example 1

We remote- controlled the robot and the robot said "morning!" to children at an entrance of the nursery school in the morning. We made the robot say something new because the children clustered around the robot and continued to stay   at the entrance and did not enter classroom. the robot said "Let's play together after changing clothes at the class room!" by remote control. But some of children came back after changing clothes to the entrance. Eventually, we moved the robot to the classroom after   greeting them briefly.

Fig.2 the robot at the entrance   Fig.3 The children clustered around the robot

of the nursery school in the morning

Example 2

One day the robot was surrounded by the children and it appeared that the our robot was being picked on. We inputted new expression "Stop it!" into PDA device and the robot said it.

The director of the nursery school told us that children were not picking on the robot. But and they were only playing with the robot which was at their disposed.

Hearing her comment, we could see that the children were not bullying the our robot but were simply playing in all innocence. After the incident, the teachers of the nursery

school told the children to treat the robot gently.

4. Situation-based robot design

The interaction between the robot and people at the nursery school was beyond the reach of designer's imagination. In my opinion we should define "robot design " as design which include not only ideas of designer but also an unintended idea. By participating in the user community and designing robots through user's activity, situation by situation, the view point of designer will better fit the user.