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(Press release)

Nippon Telegraph and Telephone Corp.
Nippon Telegraph and Telephone West Corp.
Fukuoka Children's Hospital & Medical Center for Infectious Disease
Institute of Systems & Information Technologies/KYUSHU

Using Optical Broadband Access Network to Create a Communication Space that Instills Peace of Mind in Hospital Patients

- Aiming for a comfortable, home-like environment in which patients can speak to family members from hospital rooms at any time -

Starting from March of this year, Nippon Telegraph and Telephone Corp. (NTT), Nippon Telegraph and Telephone West Corp. (NTT West), Fukuoka Children's Hospital & Medical Center for Infectious Disease (Fukuoka Children's Hospital), and the Institute of Systems & Information Technologies/KYUSHU (ISIT) will begin a three-month joint trial aimed at improving the communication environment for child patients who are required to stay in hospital for long periods of convalescence, and who are thus subjected to excessive levels of psychological stress.

In this trial, the Children's Hospital and ISIT will be connected using B Flets, a fiber-optic IP connection service provided by NTT West. The goal of the trial is to verify the efficacy of "e-Life Amenity Services," which create a communication environment that provides child patients with the peace of mind they would feel as if they were in their own room-for example, in knowing that if they call someone will answer and allow the child to enjoy, among other services, virtual classes with links to other children, and stimulation of intellectual curiosity through network-based conversations with robots.

After the trial stage above mentioned, hospital rooms will be connected, using B Flets, to the homes of child patients actually in hospital, so as to create an environment that enables the child to communicate with his or her family at any time, while constantly being reassured of their presence. Evaluations of service effectiveness will take place at this stage.

NTT Cyber Solutions Laboratories and ISIT will build the system environment, verify the psychological effects that each system will have on the child patients, verify system effectiveness, and identify relevant issues. The Fukuoka Children's Hospital will provide the verification field, and will offer support by having doctors, nurses, and in-hospital teachers evaluate the system's effects on children. The Fukuoka Branch of NTT West will lay the physical lines and conduct network evaluations, among other operations.

<Background to Trial Implementation>

The Fukuoka Children's Hospital is the only general hospital in Western Japan to specialize in the care of children. Many children from outside of Fukuoka Prefecture

receive in-patient care at this hospital, a situation that often places great burdens, in terms of time, money, and other factors, on the families who must travel back and forth from remote locations for visits. When these children have been admitted to the Fukuoka Children's Hospital Center for infectious diseases, visits are frequently limited due to the nature of the illness. In this kind of environment, the children receiving in-patient care must not only battle with their illness; in many cases, they must also deal with the stress of being unable to see their friends, brother and sister or to attend school. The Fukuoka Children's Hospital believes that these problems have a significant effect on progress and recovery in the context of medical conditions in child patients, and had been searching for an effective means of resolving these issues.

NTT Cyber Solutions Laboratories developed the "In-hospital Classroom Support System," which supports communication environments and education for child patients on long-term hospital stays through the use of virtual space and interactive video communication technologies. The system had undergone evaluations over the past two years at the National Children's Hospital and other institutions. The results of these evaluations confirmed the system's effectiveness, but because at the time optical broadband had not yet become available for general users, video and audio quality in low-speed network environments was insufficient, and various issues remained, for example in terms of reality and responsiveness.

Once optical fibers came to be installed even to private homes for relatively low costs, NTT Cyber Solutions Laboratories are developing the "e-Life Amenity System" to overcome past issues and to create a richer, more reassuring communication environment for child patients and their families.

ISIT is currently involved in research and development related to human interfaces for information devices. Among these activities, it is researching communication support technologies that utilize robots. One of its key research themes is the development of the interface technologies required to enable not only direct dialogue between humans and robots, but dialogue across networks as well.

The Fukuoka Branch of NTT West began offering B Flets Services from November 2001, and has been pursuing services appropriate to optical broadband environments.

These four parties have agreed to combine their respective knowledge, skills, and technologies in a trial of "e-Life Amenity Services," which are designed to relieve the stress felt by child patients in hospitals and bring out the true capacity for recovery that these children possess.

<Specific Functions>

"e-Life Amenity Services" include the following functions (ref. [attached Figures 1-3](#)):

1. Intuitive Operation Interface using Virtual Pets

A virtual space is created based on the child's own room, and intuitive operation interfaces-calling out to a virtual pet or using a touch panel-ensure easy operation even by users unfamiliar with computers.

2. Status Information Exchange Functions

The system enables the patient to know in advance the status of family members at home (available, out of the house, taking a bath, in the bathroom, etc.), thus

ensuring peace of mind through confirmation of the family members' presence. The patient can also transmit his or her own status, so that the family also feels more at ease.

3. Call/response Video Communication Functions

After confirming that the family member is at home, the patient calls that person's name, and the system automatically switches to a video communication mode, thus providing a natural communication environment that allows the patient to communicate with family members as if he or she were actually at home.

4. Multi-location virtual classrooms

This is a multi-location virtual classroom that allows multiple participants to attend classes using the same teaching materials. The system relieves the anxiety felt by child patients who cannot go to school because they are in hospital, and enables these children to attend classes with their friends.

5. Smooth Conversation Environment achieved with Automatic Tracking Camera

This system provides an environment for smooth conversations by following the movements of the person in front of the camera, always keeping that person's face in the center of the picture, and sending that image to the other party.

6. Robot and Network Camera Operation Functions

Robots installed within ISIT and cameras installed in outside locations can be operated using voice commands, enabling patients to obtain real-time images of places they want to see, thus providing fun and direct contact with the outside world to child patients who cannot go outside.

<Plans for the Future>

Optical Broadband Networks offer high-quality interactive communications and provide peace of mind in communications through permanent Internet connections. In the future, we will incorporate new issues and knowledge, improving the Amenity Communication system to provide even greater joy to children recovering from illnesses or injury, and developing communication systems to provide support to senior citizens living alone based on this concept. Furthermore, we will continue to develop robot-based communication environments to support human-friendly interfaces that can be used by anyone, at any time, in any place.

- [Figure-1 e-Life Amenity Services Functions](#)
- [Figure-2 e-Life Amenity Services Functions](#)
- [Figure-3 e-Life Amenity Services Network configuration](#)

For further information, please contact:

NTT Cyber Communications Laboratory Group
PR Section; Sakamoto / Hagino
TEL: 0468-59-2032

e-mail: ckoho@tamail.rdc.ntt.co.jp

NTT West, Fukuoka Branch
General Affairs Division, PR Section; Miyazaki
TEL: 092-714-8051
e-mail: miyazaki-a@fukuoka.west.ntt.co.jp

Fukuoka Children's Hospital & Medical Center for Infectious Disease
Secretariat Manager; Matsuo
TEL: 092-713-3125

ISIT
No. 3 Laboratory; Matsumoto
TEL: 092-852-3460
e-mail: matumoto@isit.or.jp



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