

Technical Assistance System for AAC and access to Information Technology

Paul Panek, Wolfgang L. Zagler, Christian Beck, Gottfried Seisenbacher

fortec, IEMW, Vienna University of Technology, Favoritenstrasse 11/366-1B,
A-1040 Vienna, Austria. <http://www.fortec.tuwien.ac.at>

Abstract

This paper describes the technical assistance system called AUTONOMY which provides AAC, environmental control, safety and security functionality, access to tele-communication and access to internet services for severely motor and multiple disabled persons. Concept and implementation are outlined and a report about experiences from real life usage is given. In the areas of therapy, training, education and independent living the system enables persons with special needs to live a more independent and self determined live.

Introduction and Aim

Severely disabled individuals encounter significant barriers while communicating with their social and material environment. The aim of the AUTONOMY research project was to develop and to extensively validate a PC based system which is able to serve as a mediator for the person with disability in order to enable specific communication towards material and social surrounding [1].

Methods

Using a multidisciplinary approach based on the expertise of therapists, teachers, disabled persons and IT experts, a system structure has been developed which separates user interface design from application. Additionally, in order to fit well in the daily life situation, three different user groups have been identified (disabled person, care persons, system integrator) and specific tools have been implemented for each group.

From point of view of the disabled person the system allows communication in synthetic as well as recorded speech, symbol languages as BLISS or written text, environmental control for consumer electronics, electric doors, intercom, smart home bus (EIB – Konnex Association) etc. Access to telephone networks is possible via an infrared controlled phone which also allows to use a virtual answering machine. Environmental control and access to personal computers is possible via the defacto standard of SerialKeys protocol (Apple, Microsoft Inc.). The disabled users interacts with the system via multimodal bidirectional icons [4].

From point of view of a care person the system can be easily configured to meet the needs of the disabled persons. This is possible as the system hides most of the technical stuff so that the care person (family member, therapist, teacher etc.) can concentrate on configuring user interface and communication strategies.

Several prototype systems have been installed at a support centre for motor and multiple impaired persons in Tyrol, in a smart room at a public school in Vienna, in several classrooms, in hospitals, rehabilitation centres and at private homes. The system has been validated in real life usage by a multidisciplinary team with very good success.

Results

During long term validation it could be found that several areas are most important: Usage of AUTONOMY with children and adolescents in order to train them to get used to AAC and environmental control. This starts with strengthening first experiences of cause and effect, towards communication of basic needs up to using the system for free communication and for telling stories to the care persons. Parts of these persons are using BLISS language. Conventionally printed BLISS maps had been transferred to a dynamic BLISS hierarchy on the AUTONOMY system.

Secondly, the system is being used by severely motor disabled non speaking persons as assistance for living a more independent and self determined life at their private home. Typical applications are AAC for non speaking, alphabet tables with integrated symbol tables for ADL, using phone and answering machines for communication with friends or for organising schedule of the personal assistance staff.

Specific applications also were set-up together with two locked-in patients in Austrian hospitals and with two non-speaking and severely motor disabled and wheel chair bound students of Austrian universities. They are using the system for playing, stopping, rewinding etc. audio tapes with recorded lectures on it and for accessing internet browser, email, video conference software and even software development kits which allows one of them to write his own source code.

Due to the very positive results from the validation a commercial version of AUTONOMY [1] could be implemented and was released in 1999.

Discussion

It is still true that barriers are existing when persons with disabilities want to communicate with their environment. But it could be shown that up to date technical assistance systems provide significant means to lower these barriers and empower severely disabled persons to influence more independently their own lives. These systems are able to serve as a mediator in order to communicate the persons' will to the social and material environment. Current research activities focus on adding RESORT tele-help and tele support modules [2,3,5] to the system and to establish networks of AUTONOMY users in order to improve exchange of information and experiences and in order to reduce existing difficulties in daily life usage further on.

References

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