Connected Vitality Network: Enhancing Elderly Life

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Abstract

Modern ways of living often demand that people live and work at places distant from their birthplace, leaving elderly family members (e.g. parents, aunts etc.) to suffer from loneliness due to social isolation. Moreover, the percentage of the matured population is continuously rising, increasing the needs for care. In fact, the majority of the elderly population in Europe lives in isolation, away from their closest family members and without the company of friends or a continuous support by their health-carers. Due to this increasing isolation, the need for human contact is such that the seniors enjoy even the simplest everyday social contact with other persons [1]. CVN (Connected Vitality Personal Telepresence Network) project enables elderly people who are restricted in terms of their mobility to choose lifestyle, activities and means of social interaction in respect to their personal needs, abilities and preferences.

The CVN system, by providing audio and video communication with family, friends and relatives anywhere in the world, aims to reduce elders' isolation and enhance family and community participation. According to research works, the aforesaid communication format has the highest social presence or media richness among voice mail, text and electronic mail [2], [3]. This has to do basically with the face-to-face interaction involved when using computer-mediated audio and video communication. This project has researched and identified audio, video and other communication means that are highly essential so as to aid the elderly and reduce isolation.

The presentation will start by focusing on research questions that have driven the project's research and implementation decisions. An important research question is: *"What (social) activities create meaning in elderly life and what gives elderly the sensation of being socially present"*? The project attempts to answer these research questions by conducting workshops, expert interviews and surveys. The presentation

will focus on the results obtained, as well as the decisions taken based on these results regarding the design, architecture and implementation. For instance, the results revealed that the most meaningful activity for the elder is "spending time with family, children, grandchildren and friends", by e.g., playing games, or just drinking a cup of coffee together, chatting about life.

The CVN project considered the above findings to offer a cost effective Telepresence solution. Telepresence, allows an observer to view a remote scene from any viewpoint of choice and thus give a sense of presence, as opposed to conventional video viewing [4]. This solution aids elderly in overcoming social isolation barriers, communicate, act and react on their community, be informed about health issues of their concern and be properly monitored by health care staff.

Figure 1: The Meet Format of the CVN system.

The presentation will proceed with presenting the three communication formats that have been implemented based on the results of the workshops, the expert interviews, the surveys mentioned above and considering the capabilities of the manufactured device; see Figure 1. These formats are:

- One-to-one Meet format: the Meet format addresses the main requirement of easily contacting the family or friends. The format should provide an almost life-sized picture of the communication partner and thereby makes it possible to actually experience of being present within a communication; see Figure 1.
- Many-to-many Club format: the Club format addresses the older adults' needs regarding participating in social activities together with others, such as playing games.
- Many-to-many Teach format: the Teach format meets the older adults' needs of conducting voluntary work.

Regarding related work, we will present the background research we have conducted considering state-of-the-art projects and services in the general areas of telepresence, audio/video conferencing and teleassistance. This research was conducted to identify what type of systems are currently available in the market, understand the issues and challenges in the area and finally realize the kind of communication system required to serve our objectives. Bearing in mind the need for a modular and easily expandable

architecture (especially by third parties) we focused our research on available open source projects. In the presentation we will talk about the above process, as well as the reasons for selecting the BigBlueButton (BBB) [5] as the best candidate for the CVN network.

We will also present the background research that was conducted considering projects and services in the general areas of applications for elderly people involving the user physical activities as well. A number of activities take place that contribute to the elders health, such as playing movement games (e.g. handball, balloon games), while some applications are needed for fun, e.g. taking virtual tours together using panoramic imagery. In this way the elders can share their experiences of life in a fun and easy to use way, being together and being active together. The CVN project adopts the "no keyboard, no mouse" today's tablet application philosophy by using a touchscreen. Thus, a deep state-of-the art work was conducted about the tablet PC application design methods and multiplayer considerations of them. The presentation will talk about the implementation of the module responsible for obtaining user feedback and movement control for the CVN system, which is used especially for entertainment and rehabilitation purposes of the users: the Kinetic Module.

We will next present the architecture of our system, as well as the systems and tools we have used for implementing the CVN system. Finally, the presentation will specifically focus on the device that the CVN project has created. The device offers a digitally shared acting area via its panoramic camera views. This digitally shared view of the user's acting perspective allows improving natural communication via auditory and visual cues and through a more realistic animation of human behavior.

The presentation will be finalized by presenting the current phase of the project, analyzing any problems, issues and challenges faced until this stage and by presenting the evaluation procedure to follow the upcoming months.

Acknowledgement

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