Finding value in memories

Through the investigation of new and possible future forms of smart personal computing devices, as well as smart environments and innovative and adaptive user interfaces, Smart Internet Technology CRC is developing a range of applications that will assist in improving the quality of life of Australia's aging population. With the proportion of people aged 65 and over predicted to be one third of the population by 2030, ensuring their mental and physical fitness is an increasing priority.

Beyond personal computing

Project Nightingale is a joint research effort between Smart Internet and National ICT Australia (NICTA is funded by the Australian Government's Department of Communications, Information Technology and the Arts and the Australian Research Council through Backing Australia's Ability and the ICT Centre of Excellence program). Nightingale aligns with the Government's National Health Priority Area initiative and National Research Priorities, by exploring the needs of Australia's aging population and the role of Internet technologies in reminiscing and memory sharing.

The project's goal is to develop non-desktop interfaces through which a user can access, organise and interact with their own virtual personal space within a pervasive computing environment. The project leader of Nightingale, Senior Research Fellow at the University of Sydney Dr Aaron Quigley, says the team was taken by the idea that in the future a person will carry a matchbox-sized personal server, or basic computing device, with them. This small portable device will contain a large amount of storage and computing power, but has no input or output mechanisms for the user. Instead, it interacts wirelessly with other devices around it and utilises those as its interface, based on their appropriateness and availability for the task.

One model proposes the use of short-range Bluetooth wireless data communication to send messages between a personal server and other Bluetooth equipped devices in the vicinity, such as a display screen, MP3 player, pen, headset or mobile phone. Should the user wish to watch a video clip, instructions are sent to the personal server, which then selects the nearby screen as the most appropriate display option, and plays the video clip.

"We envisage a world where computing power is embedded in every day devices. Based on a set of assumptions we are building pieces of technology and exploring new types of human computer interaction. The days of people interacting with a computer solely through a keyboard and mouse are numbered. Voice, gesture and pen are more familiar than a keyboard interface designed for typewriters in the 19th century. If all we achieve are a set of applications based on the PC of today, then these have a lifespan of only three or four years, and there are much larger commercial organisations out there doing that. Instead we are researching next generation technologies and applications."

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New applications for an aging population

Aaron says that to date research projects in the field of pervasive computing have focused on topics such as smart homes, smart spaces, intelligent offices and home telecare health services. Social and intellectual fitness applications that cater to the specific demographic of the elderly have received little investigation. The technology being developed by Smart Internet CRC involves using natural environments and objects, such as a scrapbook and photographs, as the means for human-computer interaction. These applications use a suite of personal and peripheral computing devices that provide context-aware services and data.

Project Nightingale's first phase consisted of an interview process, where elderly Australians were asked about the way in which they reminisce, with a target group given a set of tools with which to measure and record how they go about this activity. Aaron says the therapeutic benefits of reminiscing are well identified.

"Reminiscing increases intellectual fitness and sense of purpose. And if people can perceive themselves as reminiscing, and storing those reminisces, they actually become a storyteller. Creating a family history improves one's sense of purpose and intellectual fitness. If we can develop some tools that enable easy access, easy capture, easy sharing, and some novel ways to share, then we'd be able to get a lot of people to use our systems really quickly."

Scrapbooks and memories

Two prototype applications have been developed. The first involves a pen and paper scrapbook application scenario, using a personal server and intelligent digital pens. The interface is just like a real scrapbook, and hence familiar. The scrapbook can consist of a number of pictures, written notes and user-drawn application markers, with the markers read and interpreted by the individual's personal server. The pen and paper is used for inputting data and controlling access to information with the system, with the various controls defined by the user. For instance, ticking a hand-drawn marker relating to an audio clip can replay that particular audio clip through a set of headphones.

A second demonstrator application utilises a tabletop user interface called Diamondtouch, from Mitsubishi Electronic Research Laboratory (MERL), which passes a small electric current through the user's body to determine their interaction with the surface of the interface. This allows a person to use simple physical gestures to share and manipulate media items, such as digital pictures, and to create relations between items that can then be stored in a virtual personal museum.

Interfaces of tomorrow

Aaron says by removing the classical user interface of a computer, mouse and keyboard, the benefits of Internet technology can be delivered in a more familiar and natural manner. Both applications are likely to form the building blocks for a new generation of computer interface models, enabling new forms of applications and extending the usage of computing technology to new groups. In the instance of the scrapbook, Aaron says it is not hard to imagine it being applied to other applications, such as a homework notebook or email management system.

Should the project succeed in its goal of bridging the huge gap that exists between the insights, memories and historical information held by older generations, and a computing medium where this information can be stored and shared, it will achieve its objective within the Government's National Research Priorities program of using Internet technology to assist older individuals.

Contact us today to discuss how you can benefit from Smart Internet R&D either by email to innovation@smartinternet.com.au or call 02 8374 5080.

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