

SPOKEN SUPPORT FOR EVERYDAY LIFE

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ABSTRACT

Speech output invoked at the appropriate time when older people are completing a task can be very powerful. It provides the equivalent of a friendly helper at your elbow telling you what to do next, guiding you through a procedure or warning of possible dangers.

This paper introduces speech support in the domains of web browsing and car driving two very different applications where speech has shown to be useful, explores its potential and looks at the special issues involved.

Keywords

Older people, speech output, web browsing, car driving, memory loss, interface support

1. INTRODUCTION

Speech output can play an important part in helping older people to execute every day tasks or to help them execute them more efficiently. It can also provide useful information about the environment and things happening around them, which older people may not readily absorb for themselves, or act as a reminder concerning previous interaction for those with poor memories.

Although this paper focuses on interaction with older people, as a user group they also fulfil a useful role as extreme users who pick up interface design problems that other groups work around and are less aware of. Help and support made available to older people can also prove useful for other users in more extreme contexts. For example a young person executing a task in distracting circumstances faces similar problems to an older person with memory loss and low confidence.

This paper demonstrates how helpful speech output can support older people in day-to-day tasks by providing vital information that younger people might absorb for themselves unconsciously.

Older people can also be viewed as extreme users of systems who push the boundaries of good design, reacting to design problems that younger more flexible users simply work around. Thus they usefully detect important failings. Finally, interface design features that are useful for older people frequently prove to be useful for everyone.

2. OLDER PEOPLE AS EXTREME USERS

It is well known that ageing affects short term memory and the ability to absorb general background contextual information together with the ability to multi-task.

Loss of memory and general awareness causes loss of confidence in one's actions. Here confidence boosting and affirmative speech output has proved to be very useful (Zajicek and Hall, 2000).

The ability to absorb information is also age related. Older people were found to be less able to absorb long instructions than younger people (Zajicek and Morrissey, 2001). Speech support that appears at the point it is needed removes the need for long instructions at the beginning of a task.

The aim of speech support is to:

- compensate for memory loss suggesting actions that have not been remembered
- help with strategising by making contextually relevant suggestions i.e. what to do next in computer interaction
- enable instructions to be passed in smaller messages
- provide contextually relevant advice i.e. advice about road conditions
- provide warnings in safety critical situations

Perception of the speech support system is in many cases as important as the functionality. An important factor for acceptance and thus usage of speech support is that the system is well liked and trusted by the target group.

3. SPEECH SUPPORT IN COMPUTER INTERACTION

Age related memory loss means that older people experience difficulty building strategies at the interface..

Speech output which talks a user through their computer interaction, letting them know where they are and what they can do next, have been used successfully within the domain of Web browsing. It was found (Zajicek and Hall, 2000) that older adults who had not been able to use a voice Web browser without speech output were able to use it when Voice Help was installed. What's more longer trials

showed that once older people had listened to instructions concerning where they were in their interaction and what they can do next, for some time they reached a point where they started to 'know' what to do next. The instruction message appeared to become resident in long term memory rather than the user having to rely on short term memory to remember what they did last time.

4. SPEECH SUPPORT WHEN DRIVING A CAR

Older people are less aware of their surroundings and less able to multi-task with poorer judgement.

Speech support for in-car systems is under test at Toyota and Stanford University (Jonsson et al, 2004). In particular the nature of the output for advice about dangerous driving is under investigation. The aim of researchers is to find the most acceptable form of speech output that helps drivers retain relevant information and provide timely warnings about hazards on the road. Advice is not always easy to accept which makes the social implications of the speech output very important. Previous studies show that linguistic, such as language style and structure, and para-linguistic cues such as emotional colouring, recorded or synthesised voices and age, gender of voices, in speech play a large part in user perception of speech support and of the system as a whole.

5. SPEECH SUPPORT IN THE FUTURE?

We envisage intelligent speech support systems that can help and advise older people while completing a range of day-to-day tasks. As in our web browsing example they will hopefully enable older people to complete tasks that had previously been thought to be too difficult, introduce them to the workings of Information Technology and while driving a car provide background information which they are no longer able to retain. This will also pave the way for better design and useful support for the whole population.

Speech support has also been used to direct older people in matters of personal hygiene in the bathroom (Assests 2002).

Many situations where a care provider or instructor supplies useful comments and directions are potential candidates for speech support. Sensors are easily

positioned to measure physical actions within the house or further a field thus enabling relevant speech output to be targeted at many aspects of day-to-day living.

6. CONCLUSION

Speech output can act in the same way as spoken advice and we have shown that it enables tasks to be completed that might have been impossible before.

It can also contribute significantly to safety and the possibility of living independently.

Having established that these systems are useful. We find that when looking for acceptance and responsiveness to the message, the work at Toyota has demonstrated that the nature of the support is very important. In addition to properties of the voice system, cultural differences also play an important part. The Toyota trials were carried out in West Coast America. Spoken output that works for user groups in that area may well not work for those in the UK.

The authors plan to investigate differences between the Toyota group and clients at Age Concern Oxfordshire and explore further how these systems can be integrated seamlessly into the lives of older people and thus enable them to live independently for longer.

7. REFERENCES

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