
Current Progress in Interaction Design for Seniors

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Abstract

With the rapidly aging populations around the world, research on technology as related to the elderly is becoming increasingly relevant. In this paper, we review papers addressing this topic during the last ten years at the CHI conference. Insights from this review allow us to gain an overview of what has been achieved in the field so far and to recommend future directions that the community should look into.

Author Keywords

Interaction design, elderly, seniors, review

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Human Factors, Aging, Technology, Design

Introduction

The elderly is a group of users that can no longer be ignored. The United Nations report *World Population Ageing: 1950 – 2050* [17] characterizes aging in the 21st century as being ‘unprecedented’, ‘pervasive’, ‘enduring’ and as ‘having profound implications’ on many faces of life. In that regards, the need to develop appropriate and usable technologies for seniors is more relevant today than ever before. Older adults stand to

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benefit greatly from new technologies [7], which can help them to remain independent, productive and connected to other people and services [3]. In order to understand pertinent topics that should be addressed in future studies and uncover new, potential research directions, it is helpful to look back on what has been done in the field so far. We present a review of the literature on the elderly and technology by analyzing papers published on related topics in the CHI (Conference on Human Factors in Computing Systems) proceedings. A search revealed fifty topic-relevant papers of all types (including full papers, notes, work-in-progress, doctoral consortiums, workshop papers, etc) over the last ten years (1999 to 2009). However in the final analysis, we excluded four papers which did not include any formal studies or systems. Those were mainly papers from the HCI Overviews, Panel, and Workshop proposal categories. Table 1 shows a summary of the paper count.

With the help of the authors' keywords stated in the papers, we were able to categorize the papers into 10

Table 1. Relevant elderly-related papers in the last 10 years of CHI

Year	No. of papers	Categories	No. of papers
2009	7	Social Interaction	7
2008	1	Interface design	6
2007	2	Design methods	5
2006	9	Intergenerational	5
2005	9	The Web	4
2004	3	Domestic technologies	3
2003	2	Navigation aids	3
2002	0	Technology training	3
2001	2	Understanding seniors	3
2000	0	Tangible interfaces	2
1999	9	Total	41
Total	44		

categories (Table 1). The following sections review some of these categories, and finally identify what we see as gaps in the current literature about research on the human-computer interaction (HCI) and aging.

Enhancing Social Interaction

Older people generally have a deeper need for social connectedness than younger adults, who are mostly preoccupied with work in their daily life. Aging usually also brings about a decrease in the number of relationships and opportunities to meet up with friends and acquaintances, either because of chronic health conditions or loss of loved ones.

Ma and Cook [13], at CHI, have researched on visual languages that can help the elderly to interact with others, especially in multicultural settings. Gregg [6] concluded that technology can help older adults feel more connected with the community through a descriptive case study conducted in elderly's homes equipped with plain-old-telephone-service-based videoconferencing units. On a different note, after examining the social needs and barriers of households in a qualitative study, Morris and al. [14] suggest that computing technologies should be used as "catalysts" rather than as "substitutes for human relationships".

Yet, research in this area at CHI has seen a number of projects on the issue of artificial companionship in particular. Bickmore and al. [2] developed an embodied conversational agent, in the form of an exercise advisor, that the elderly can interact with in their homes via a touch screen. Their acceptance study showed that the seniors' relationship with the agent was "more similar to a close friend than a stranger". Other systems set to act as artificial companions have

been designed in, for example, the ECHOES project, focusing on the issue of losing important loved ones in the life of an elderly, the HOMIE project, which consists of a stitched dog integrated with speech synthesis aimed to provide entertainment and medical care assistance to the seniors, and VIRGO, a surrogate companion consisting of an LCD touch screen, a CPU unit and an experimental health monitor, conceptualised based on interesting results garnered from focus groups conducted on the meaning of the term 'companionship' for the seniors.

Interface Design for the Elderly

Design recommendations for elderly-targeted technologies or to render common technologies more elderly-friendly have been common in the literature on aging and technology. Changes particularly in the cognitive, sensory and psychomotor functioning of adults as they grow older mean that the elderly often require interfaces to their specific needs.

At CHI, this research area has been studied in a variety of context, namely in terms of font requirements for online text [1], pen-based selection accuracy [9], cursor pointing through the use of proxy targets [10], usage of hyperlinks in small devices [18], the value of multimodal feedback [11], and mobile phone design [15].

Discussion and Conclusion

All work related to the elderly refer to the demographic change of aging populations around the world as a major motivation for research. As more and more people advance in age, especially those from the 'baby-boom' generation who are better acquainted with the usage of technology, research in designing senior-

friendly interfaces, applications and systems become increasingly relevant. From our ten-year review of the corpus of work on the elderly and HCI at CHI, this topic is still under-researched. Despite some significant studies, there is still much potential for further avenues of research in the area. Studies exploring the context, needs and actual reality of the elderly would be especially helpful since understanding the target audience is a crucial initial step in any design process.

Adults certainly face diminishment in some of their abilities over their lifespan. Although it is unreasonable to define older adults in terms of age-related changes or impairments, these potential characteristics must be considered if a design is to be inclusive [3]. Nevertheless, we should remember that older people also have years of experience, knowledge and wisdom [6] that can be tapped into to enrich the design process and inform technology design concepts.

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