

# Introduction to the Special Thematic Session: Human–Computer Interaction and Usability for Elderly (HCI4AGING)

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**Abstract.** Industrialized countries are faced with severe demographical and social changes. Consequently, areas including Ambient Assisted Living are of increasing importance. The vision is to provide technologies for supporting (elderly) people in their daily lives, allowing them to stay longer within their own home aiming at living independent and self-determined. User Interfaces in such systems are mostly multimodal, because standard interfaces have limited accessibility. Multimodal user interfaces combine various input and output modalities (including seeing/vision, hearing/audition, haptic/tactile, taste/gustation, smell/olfaction etc) which are classical research areas in Human-Computer Interaction (HCI) and Usability Engineering (UE). One of the advantages of multiple modalities is increased usability: the weaknesses of one modality are offset by the strengths of another. For example, on a mobile device with a small visual interface and keypad, a word may be quite difficult to read/type, however very easy to say/listen. Such interfaces, in combination with mobile technologies, can have tremendous implications for accessibility and can be a benefit for people. An important issue is that interfaces must be accessible, useful and usable. Traditionally, HCI bridges Psychology/Pedagogy and Informatics, while UE is anchored in software technology. Together, HCI&UE provide the emerging potential to assist the daily workflows in the realm of AAL. This special thematic session is devoted to promote a closer collaboration between Psychologists, Pedagogues and Computer Scientists.

**Keywords:** Human–Computer Interaction, Usability Engineering, User Interfaces, Older Adults.

## 1 Introduction and Motivation for This Special Thematic Session

In most industrialized countries the demographical, structural and social trends tend towards more and more elderly people in single households, which definitely has

effects on health care, emergency medical services and of course of the individuals themselves [1]. Older people and new technologies are one of the important research and development areas [2], where accessibility, usability and life long learning play a major role. For example, intelligent User Interfaces (UI) for Ambient Assisted Living (AAL) intend to support elderly by application of intuitive and natural interaction [3]. However, such applications must be designed and developed to support the needs, the new, and special, demands and requirements of the individual end users. Clear benefits must be offered, whether in a physical, medical, emotional, motivational or educational respect.

The design and development of IT must support the elderly end users, especially to overcome their fears and enable them to accept technological aids and mobile devices without reservations. The design must then reflect the acceptance of the end users and not be the cause of new biases [4]. In order to ensure this, the HCI community developed a variety of User-Centered Design (UCD) techniques during the last 15 years [5], which are meanwhile established usability engineering methods [6]. Unfortunately, UCD concentrates mainly on externalist human issues [7], with the risk of ignoring important internalist issues, although the technological issues are equally important [8].

The HCI community has hoped to fix all problems by even better user-centered methods, but UCD alone is insufficient [9]. The appropriate methods behind are very different and come from various backgrounds with often completely different styles of working [10]. Consequently, in this special thematic session we aim to bring together people from Psychology, Pedagogy and Computer Science. And we are of the opinion that they are equally important and exactly those fields can contribute to the overall goal of computing helping people with special needs.

## 2 The Special Thematic Session Program

From a total of 24 papers submitted to this special thematic session, 11 were carefully selected after peer review: After a brief introduction to the special thematic session, presenter 1, Holzinger et al., from Austria, starts with an investigation on the acceptance of ubiquitous devices within the real-life environment of a special clinic for elderly people suffering from dementia. Followed by presenter number 2, Julio Abascal et al., from Spain, with a report on the design of adaptive interfaces for supportive ambient Intelligence environments for the elderly. Presenter 3, Eduardo Carrasco et al., from Spain, demonstrates advances in interaction between virtual characters and persons with Alzheimer's disease. Followed by Sergio Sayago et al., also from Spain, exploring the role of time and errors in real-life usability for older people.

Jarek Krajewski et al., from Germany, presents an acoustic framework for detecting fatigue in speech based Human-Computer-Interaction. Presenter 6, Martina Ziefle et al., from Germany too, demonstrates visual and auditory interfaces of advanced driver assistant systems for older drivers.

Followed by Emiliano Castellina et al., from Italy, who talks about eye tracking impact on quality-of-life of ALS patients. Presenter 8, Ulrike Bechtold et al., from Austria, talks about participative approaches for technology and autonomous living of the elderly. Rüdiger Heimgärtner, et al., from Germany, presents some issues from

cultural to individual adaptive user interfaces to help people with special needs. Followed by Martina Ziefle et al., with a paper on the effects of icon concreteness and complexity on semantic transparency: younger versus older users. And the 12<sup>th</sup> and final presentation is provided from Andreas Holzinger et al. on investigating usability metrics for the design and development of applications for the elderly.

Of course this can only be a small step towards reaching the goals of making technology easier accessible for our elderly generation, however, every great leap must start with a small step.

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