GUEST EDITORIAL: Accessibility, Inclusion and Rehabilitation using Information Technologies

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After years of collaboration between the University of the Balearic Islands and the University of Havana in the areas of rehabilitation, inclusion and accessibility using information technologies, the idea for a conference on these subjects emerged. The conference named Accessibility, Inclusion and Rehabilitation using Information Technologies (AIRtech 2011) aimed to establish an open exchange dedicated to the presentation and discussion about topics related to accessibility, inclusion and rehabilitation using information technologies. In AIRtech 2011, 16 summaries were selected from a total of more than 40 submitted. Finally, from these 16 initial summaries, six extended papers have been selected for the present special collection.

1. Introduction

Social exclusion occurs when individuals or even entire communities of people are blocked from rights, opportunities and resources preventing them from full participation in the activities of the society in which they live. In today's society, the ability to access, adapt, and acquire knowledge using information and communication technologies (ICTs) are known to be critical for social inclusion.

Disabled or ageing (or even both) people are often among those that can experience problems for social inclusion. According to the *United Nations' Convention on the Rights of Persons with Disabilities*, people with disabilities *"include those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others"*. An international review of literature on ageing and disability reveals common or overlapping issues for the two groups. According to the "*UN Human Development Report 2005*" population ageing is occurring worldwide. The world has never seen as aged a population as currently exists globally. The occurrence among older people of illnesses or accidents resulting in disabilities is signicant. Therefore the number of disabled people increases noticeably, for example, there are about 80 million EU citizens with a disability.

The facts above motivated, some years ago, research groups of the University of the Balearic Islands and the University of Havana to joint investigative efforts in the areas of rehabilitation, inclusion and accessibility using information technologies. After fruitful collaboration the idea of holding an international conference on these topics emerged. As a result Accessibility, Inclusion and Rehabilitation using Information Technologies 2011 (AIRtech 2011) was held between 13–15 December in Hotel Parque Central of Havana, Cuba.

AIRtech 2011 aimed to establish an open exchange dedicated to the presentation and discussion of its main topics. These were the application of ICTs in the treatment of people with physical functional limitations, in the social inclusion of people with different skills and preferences, and

in the rehabilitation of patients with all kinds of disabilities. Despite a call for papers giving a deadline of less than six months, more than 40 summaries were received. From these 16 were selected and invited to publish an extended paper to a special collection of the *Journal of Research and Practice in Information Technology*.

2. Special collection

The title of this special collection is *Accessibility, Inclusion and Rehabilitation using Information Technologies* and the included topics are:

- Assistive technologies enabling people with functional limitations to perform tasks that they were formerly unable or poorly able to accomplish.
- Assistive technologies providing people with social inclusion problems with enhancements and/or new methods of interacting with modern technology.
- E-Inclusion technologies as new proposals leading to more accessible and usable ICT products and services for people with different skills and preferences, who use them in different contexts.
- The use of ICT in the rehabilitation of patients with diverse motor disabilities or other kinds of impairments.

At AIRtech 2011, five works about assistive technologies (Sanz *et al*, 2011 ((pp 3–4)); Sanz *et al*, 2011 ((pp 7–8)); Bidarra and Oyamada; 2011; Ortega *et al*, 2011; Taibo *et al*, 2011), seven works about inclusion technologies (Sanz *et al*, 2011 ((pp 5–6)); Bhuiyan and Picking, 2011; de Araujo *et al*, 2011; Bernardi and d'Abreu, 2011; Cagigas *et al*, 2011; Ibarz *et al*, 2011 ((pp25–26)); Ibarz *et al*, 2011 (pp27–28))) and four works about rehabilitation (Morie *et al*, 2011; Brooks, 2011; Pulido *et al*, 2011; Jaume-i-Capó and Varona, 2011) were accepted. These gave a broad view of the current research in the field.

3. Selected papers

All the works accepted in AIRtech 2011 were invited to publish an extended paper to this special collection. From the extended versions received, five have been accepted for the present special collection. The following is a short review of each one:

- In "*Accessibility as a Service: Augmenting Multimedia Content with Sign Language Video Tracks*", de Araujo *et al* (2011) explore the concept of *accessibility* as a service proposing a cloud computing service to help deaf people to access digital contents. The system is able to translate text to the Brazilian Sign Language that is presented to the user through a 3D-avatar. Preliminary tests performed with Brazilian deaf users give the system a moderate score but the main issue, the making of the virtual signing 3D-avatar more natural for the deaf, is identified and therefore able to be improved.
- In "*Towards a Framework for Inclusive Gesture Controlled User Interface Design*", Bhuiyan and Picking present a gesture-controlled user interface (GCUI) application called OpenGesture to help users carry out everyday activities. In OpenGesture simple hand gestures allow the user to perform a range of tasks, for example make a phone call, via an augmented reality television interface. Evaluative studies of the usability and inclusivity of OpenGesture are presented.
- In "*Development of an interactive kiosk with screen amplifier for low vision and old-aged people*", Bidarra and Oyamada present a proposal of an interactive kiosk with multisensory resources,

especially for people with low vision or the old aged. The system is multimodal to enable visual, auditive and tactile features to interact with the kiosk. A specific low cost and easy implementation mouse with sensor vibration has been specially developed for this solution. Despite the validation of the solution, it is still under development; results for one of the tools of the kiosk, the screen magnifier, are presented.

- In "*MonAMI: Mainstream on Ambient Intelligence. E-inclusion Living Scaled Field Trial Experience in Spain*", Ibarz *et al* show the result of an EU project with 14 partners and several big enterprises to investigate the feasibility of the deployment of open platforms for Ambient Assisted Living (AAL) services. Tests of user acceptance and usability of the services were conducted with participants including elderly persons with disabilities, and care staff. MonAMI builds on the results of previous European projects under the 6th and 7th European Framework Programs and aims to move AAL services from the laboratory and small scale demonstrators to the status of mainstream technology. The authors valued the results of the living scaled field trial experience as a success.
- In "*Active and Non-Active Volumetric Information Spaces to Supplement Traditional Rehabilitation*", Brooks presents the results of SoundScapes, a research framework that began in the mid-eighties with the objective of investigating how traditional rehabilitation and therapy can be influenced by alternative approaches. In SoundScapes, human motion is used to treat the patient via mirrored activities in a responsive interactive environment. Concepts like Game-Abilitation and ArtAbilitation are presented and its implications for the rehabilitation of people with disabilities discussed.

4. Conclusions

With the selected works we try to show how Information and Communication Technologies can play an essential role in today's digital society. Besides being used at work, in relationships, in dealing with public services as well as in culture, entertainment and leisure, ICTs can and must provide new ways for the achievement of social inclusion. The scientific work of the authors appearing in the present issue is a contribution in this direction. We also hope that readers of this special collection will be encouraged to research in a field that focuses on empowering the capacities of the impaired for a sounder life.

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