Partnerships for Social Innovation in Europe

Proceedings of the AAL Forum 2011 Lecce
Partnerships for Social Innovation in Europe

Proceedings of the AAL Forum 2011 Lecce
Ilse Bierhoff, Henk Herman Nap, Wil Rijnen, Reiner Wichert (eds.)

Partnerships for Social Innovation in Europe

Proceedings of the AAL Forum 2011 Lecce

© Smart Homes 2012
# TABLE OF CONTENTS

## INTRODUCTION ......................................................................................... 1
- Forum programme committee........................................................................ 3
- Foreword...................................................................................................... 5
- The Lecce Declaration.................................................................................. 7

## WELCOME NOTES ......................................................................................... 13
- Welcome from the AALA President................................................................. 15
- Welcome from the Minister of Education, University and Research.............. 17
- Welcome to Apulia Region............................................................................. 19
- Welcome to Lecce ..................................................................................... 21
- Welcome to the Province of Lecce ................................................................. 23
- Welcome from the Chairs ............................................................................. 25

## CONFERENCE SESSIONS .............................................................................. 27
- Track A Rationale .................................................................................... 29
- Track A Notes............................................................................................. 33
  - Session A1: The role and needs of informal carers in AAL ....................... 35
  - Session A2: Physical and mental wellbeing and care for older adults with cognitive impairments and their relatives and carers ....................... 37
  - Session A3: AAL solutions for self-management of chronic conditions by older adults ................................................................. 39
  - Session A5: Topical gaps and issues for future development in AAL ....... 45
- Track A Papers ............................................................................................ 49
  - ALADDIN: A home care system for the efficient monitoring of elderly people with dementia................................................................. 51
  - A Taxonomy of Ambient Assisted Living (AAL) Self-Management Systems ... 59
  - An Inertial Sensing System for Advanced Chronic Condition Monitoring and Risk Prevention................................................................. 65
  - The PAMAP system: a physical activity monitoring and tutoring ICT solution . 73
  - User Acceptance of Virtual Coaches in AAL to Motivate Elderly for Physical and Social Activity ................................................................. 81
  - Methodological Perspective: System Visioning for the Future of Wellbeing & Care..................................................................................... 87
Track B Rationale ................................................................................................. 93
Track B Notes ........................................................................................................ 97
Track B Social Interaction ..................................................................................... 99
Track B Papers ....................................................................................................... 115
  Elderly people – New Media … Contradiction or Chance? Experiences from the ALICE project ................................................................. 117
  Elderly Personas A Design Tool for AAL Projects Foc using on Gender, Age and Regional Differences ......................................................... 125
  User Requirements in ICT-Based Social Media Use: Acceptance of a Virtual Coach ....................................................................................... 131
  The Rise of the Silver Surfer: Web 2.0 Participation by Seniors ....................... 135
  Intergenerational Activities Supporting the relationship between grandparents and grandchildren through online activities ........................................ 143
  Play with your life: Preventive impact on wellbeing of elderly through AAL based solution ...................................................................................... 151
  A social reminiscing system for intergenerational communication: user needs analysis ...................................................................................... 159
  How to set up a win-win-situation in end-user involvement processes – the potential of participatory methods ...................................................... 165
  Exploring methods for the inclusion of older persons in online communities .......................................................... 171
  Understanding older adults’ attitude towards online social network: fostering socialization through reminiscence ........................................................ 179
  Social Interaction of Older Persons in 2035 ........................................................ 185
Track C Rationale .................................................................................................... 187
Track C Notes ......................................................................................................... 191
  Session C1: Taking part in the self-serve society .................................................. 193
  Session C2: User interfaces and user interaction ..................................................... 195
  Session C3: Self-service in daily living ................................................................. 201
  Session C4: Speakers’ Corner ............................................................................... 205
  Session C5: Panel Discussion ............................................................................... 209
Track C Papers ......................................................................................................... 215
  Characterization and Communication of an AAL Business Model ................... 217
  Independence, respect and empowerment via SOPRANO use cases ............... 227
  Tablets helping elderly and disabled people ....................................................... 237
  Virtual Reality and Augmented Reality tools for designing new highly usable human-systems interfaces ......................................................... 245
Gesture recognition interface using a bio-inspired optical sensor .......................... 255
Touch Generation: One-handed single- and multi-touch menus for the elderly 263
Mobile Contextual Assistance for Barrier Free Mobility of Elderly People in Public Transportation ................................................................. 269
Ambient intelligence to ease access by seniors to ICT-based self-services ...... 277
WayFiS: Personalized way finding service for seniors ........................................ 285
Closing the Loop in Ambient Assisted Living through Interactive Feedback ... 293
Easy, Familiar, Enjoyable and Empowering NETCARITY Services ............. 301
ACTIVAge: proACTIVe and self-adaptive social sensor network for Ageing people ................................................................. 313
A Fall Detection App for Android Phones ......................................................... 321
Usability and accessibility for persons with dementia ..................................... 325
Smart Companion: A Mobile Companion for Older Adults ........................... 333
Acoustic Applications and Technologies for Ambient Assisted Living Scenarios .................................................................................................. 337
Assistive Technology, Implementation and Local Requirements; User interface based on user preferences ......................................................... 343
A Hardware/Software Framework for Posture Recognition in AAL Applications .................................................................................................. 347
Homage for Life: A Personalised Self-Service Platform for the Ageing-in-Place Industry ...................................................................................... 355
AAS-Platform: A Software Platform for Streaming AAL Services ............... 359
ICT services for pleasant aging– SPES view .................................................... 367
The CapMouse project ..................................................................................... 375
Track D Rationale ............................................................................................ 379
Track D Notes ................................................................................................... 383
Session D1 – Open Session AAL Topics ........................................................... 385
Session D2 – Information, Learning, Interfaces .............................................. 387
Session D3 – Home Care (informal and professional care) ............................. 393
Session D4 – Primary prevention ..................................................................... 397
Session D5 – AAL at Work ................................................................................ 401
Track D Papers .................................................................................................. 407
Learn & Network – Dual approach to empower elderly people to effectively apply Digital Media in day-to-day life ............................................ 409
Senior citizens using 3D virtual environment for fun and learning .............. 413
Service Delivery Models and Socio-Economic Assessment of Outcomes in AAL Intervention ................................................................. 417
Prevention through empowerment ........................................................................................................... 423
Active lifestyle management for improved well-being of elderly people ........................................ 427
Track E Rationale ........................................................................................................................................ 433
Track E Notes ................................................................................................................................................ 437
Session E3: The experience from ageing related initiatives in the European Regions ........................................................................... 439
Session E4: Getting Older in Southern Europe ........................................................................................ 449
Session E5: Social Innovation in Active and Healthy Ageing ................................................................ 451

CONFERENC E POSTERS ......................................................................................................................................... 455
SocialTV: senior citizens now have their own network ........................................................................... 457
Being There for Them – a telepresence device to support remote social and clinical care to elderly persons ........................................................................................................... 461
Videocalling for mental illness prevention .................................................................................................... 465
Home telemonitoring for chronic heart failure ............................................................................................ 467
Mobile learning requirements for older people with diverse cognitive skills ........................................ 471
OMNIACARE: PHR system and AAL platform for Mobility, Health Monitoring and Remote assistance .......................................................................................................................... 475
Join-In – Senior Citizens Overcoming Barriers by Joining Fun Activities ............................................. 479
Introducing 3rD-Life: A 3D Virtual Environment for Social Interaction of Elderly People ................................................................. 483
Accessibility Issues @ Wikipedia .................................................................................................................. 485
Smart arm support systems - sharing the effort – ...................................................................................... 489
Health@Home: lessons learned and future perspectives in the home monitoring of patients affected by chronic heart failure ......................................................................................... 493
Activity Analysis with Sensor Fusion and Hidden Markov Model .......................................................... 499
Dementia Experience: improving care at home ............................................................................................ 503
Grid, cloud and picture-driven computing in ICT assistive technology: new concepts and market implications .................................................................................................................................. 507
Building Better Bones through Better Conversations .............................................................................. 511
User involvement and system adaptability .................................................................................................. 513
AAL4ALL: A universal care system for the ageing society in Portugal ................................................. 517
AGNES, user-sensitive home-based systems for successful ageing in a networked society Technology trends and new opportunities ................................................................. 521
Achieving Elderly Safety at Home by Automated Fall Detection with Stationary Installation for Independent Living.................................525
Phone-Based Fall Risk Prediction................................................................529
Pilot Project on Pharmaceutical Home Assistance in Comunidad Valenciana.....533
Enabling Social Interaction through Embodiment (ExCITE)............................537

A YOUNG RESEARCHER’S WORKSHOP.........................................................541
YR-RISE reloaded: Research on Innovative Solutions for the Elderly.........543

AAL OPEN ASSOCIATION: EVAAL COMPETITION.................................553
1st EvAAL Competition: Indoor Localisation and Tracking for AAL..........555
Precision Indoor Objects Positioning based on Phase Measurements of Microwave Signals.................................................................561
Rule-based indoor localization using non-intrusive domotic sensors and the HOMER platform ................................................................569
Sherlock: A Hybrid, Adaptive Positioning Service based on Standard Technologies................................................................577
The iLoc ultrasound indoor localisation system with interactive badges........585
n-Core® Polaris Real-Time Locating System ...........................................593
OwlPS: A Self-calibrated 3D Wi-Fi Positioning System............................601
CapFloor .......................................................................................................609
Evaluating AAL Systems Through Competitive Benchmarking (EvAAL) – Technical Aspects of the First Competition............................617

TRACK F AT AAL FORUM 2010.................................................................625
Technology, Platforms, Standards, Interoperability.................................627
Abstract — The article introduces the basics by which tablets are considered as appropriate tools for integration and promotion of the elderly in the digital world. To prove this, the paper presents three research projects carried out by CESyA that integrate Automatic Speech Recognition (ASR), Voice Synthesis, subtitling, audiodescription or audio navigation tools into tablets for encourage autonomy and personal growth for the elderly and for people with disabilities.

I. INTRODUCTION

As people in many countries of the world become technologically competent, elder people will be ready to use Information Technologies (IT) in most aspects of their daily lives [1][2].

When considering the number of people having significant impairments and typical age distributions that show that, for age ranges over 50, hearing and visual impairments become progressively common, we can safely say that the number of homes having at least one person with hearing or visual problems is also very high and that it will increase in the coming years.

Among the recent devices that have been made available in the market, tablets are creating a great impact and almost every month a new device is announced that goes beyond previous ones in portability and performance. Touch screens are improving their performance exponentially, their responses being immediate and reliable; they support many gadgets and are able to run many applications, zoom is everywhere available, their autonomy is constantly increasing... and they are lighter that ever!

It is reasonable to foresee that in the next future most people will own and use tablets in their daily life. They would carry them permanently and even people that will be elderly by then would also be familiar with those devices.

Tablets offer the possibility to integrate technologies, at this moment applied to mitigate age related hearing or visual impairments into a single device that is affordable, popular, portable and easy to use. This is the reason why the Spanish Centre of Subtitling and Audiodescription (CESyA)\(^1\) has been involved in different research projects to develop both applications and interaction models that are based on the use of personal devices especially focusing on tablets in the last two years. CESyA is a long-term research project at the Carlos III University of Madrid financed by the Spanish Ministry of Health, Social Policy and Equality. CESyA is specialized in research, training and implementation of accessibility to audiovisual media in the fields of television, theatre, cinema, education, web and other cultural events and venues such as conferences and museums

The most relevant technologies considered by the CESyA in its strategy are Automatic Speech Recognition (ASR), Voice Synthesis, the basis to address subtitling, audiodescription, audio navigation, etc.. The different applications developed can turn the tablet into a guide for the visual impaired and an interpreter for the hard of hearing.

Experience with new tablets confirms that this new technology could be a perfect user device and could overcome sensorial disabilities in different real-time scenarios. The Carlos III University of Madrid has developed several applications within research projects in which user experiences have demonstrated their applicability.

II. APEINTA

The first one is related to education, where tablets have been used as student devices in and outside the classroom in the scope of the APEINTA project. Other experiences based on tablets in the education field prove that tablets improve learning efficiency [4]. APEINTA is a Spanish educational project that aims for inclusive education for every student of all abilities in and out of the classroom [3]. This project applies computer science to overcome barriers that unfortunately still exist today in the educational environment. Nowadays, some researchers are working in lectures transcription based on Automatic Speech Recognition [5]. Three different services are proposed by APEINTA: Firstly, a real-time subtitling service is provided, so students can use their tablets for reading the verbatim discourse of the teacher. This service use ASR mechanism and subtitling standards for automatically provide real-time subtitles. This service is useful

\(^1\) CESyA: Spanish Centre of Subtitling and Audiodescription. http://www.cesya.es
for all those students who have temporary or permanent hearing impairments or for foreign students, for instance. Secondly, a text-to-speech service is provided, allowing students with speaking problems to participate during the classes with their comments or questions. Students can use their own tablets for writing their questions and comments and submit them to the APEINTA text-to-speech server, which will convert normal language text into speech and it will be repeated aloud in the classroom with a computer voice. Finally, APEINTA provides students with an accessible educational platform in the Web, where every student can access pedagogical resources from their tablets at any-time, nevertheless of their personal and access characteristics. The project has received two awards, the FIAPAS award in 2009 for research and innovation in education (provided by the final users of APEINTA) and the “2011 Web Accessibility Challenge” sponsored by Microsoft: Delegates Award” during the W4A 2011 Conference (a scientific award).

Students can use different personal devices in the APEINTA project, like mobile phones, PDAs, laptops (see Figure 1), etc. During last months, the project has incorporated the iPad as client device; user’s experience confirms that iPad is widely accepted for use [6]. More information can be found at http://www.apeinta.es.

III. UC3MTitling

Another experience lies in the field of captioning in Theatres, where the use of tablets to show subtitles has been successfully tested as a valid alternative where screens on the stage are not possible. Carlos III University in collaboration with CESyA has developed an application to support different accessibility services in tablets and other devices. UC3MTitling is a software tool which incorporates the necessary procedures to control, on site or at distance, the synchronized projection of accessibility elements (subtitles, video for sign language and audio description) through the different channels associated with the theatre where the play takes place. This system carries out subtitling in the real time of events for an audience, without the need for highly qualified personnel. Its area of application is live events based on a pre-established script such as theatre, conferences, ceremonies, etc., which allow the synchronized broadcast of any accessibility element for a live event as it unfolds, and at a low cost. This subtitling system not only allows individuals with impaired hearing or sight to follow such events, but the rest of the audience can also benefit from them, thereby achieving complete integration for disabled persons and conditions on par with the rest of the audience.

The main advantage of this system is that the technician can carry out the synchronization of the elements without actually having to be in the theatre where the performance is taking place, with the use of an Internet connection. In this way, once the technician begins broadcasting the accessibility elements, they can be broadcast in the theatre by different channels depending on their features: texts for titles, audio for audio description and video for sign language. In addition, because of the high degree of compatibility of the chosen formats, the play’s audience can simultaneously consult them from different devices: tablet, Smartphone, PDA, etc. The use of tablets and similar personal devices for subtitle display allows in addition the use of different subtitle languages, user selectable.

UC3MTitling has been successfully tested in several performances and included in regular theatre representations at Centro Dramático Nacional (CDN), in the framework of collaboration with CESyA whose aim is to set up functions of this type on a regular basis during the 2011-2012 season of the of CDN programming. This agreement is within the framework of social awareness and action for accessible culture that the CESyA is carrying out.

2 FIAPAS is the Spanish Confederation of Parents and Friends of Deaf People (www.fiapas.es)
UC3MTitling and several user interviews appeared in the news at TV channel la Sexta in relation with the performances at the Centro Dramático Nacional: http://www.youtube.com/watch?v=8D18GKhn3K1

IV. GVAM

Also an application for tablets and associated technologies has been developed: GVAM is a research and commercial project carried out by CESyA and Dos de Mayo company for the development of Multimedia Accessible Guides (MAG) for museums [7]. GVAM is a management and publishing system for contents and guided tours designed specifically for exhibition spaces like museums or fairs. It aims to facilitate and expand publication and edition techniques for these institutions in an accessible manner. This integral technological solution to cultural spaces is being already implemented in several museums in Spain. GVAM has been developed in collaboration with associations of people with disabilities and the Ministry of Culture. After five years of work, GVAM offers a unique system that ensures the accessibility to all the contents and interfaces for the general public, not through alternative means, but universally.

GVAM Spanish technology is supported, from the beginning, by a clear vocation for experimentation and innovation. It has its own technology, both hardware and software, ensuring maximum versatility in customizing and publishing the application.

The GVAM application makes accessibility to guided tours possible to people with sensory disabilities by means of several accessibility resources that every visitor can freely activate to adapt to her or his needs. Some of them are real-time subtitles, audio description, audio navigation, sign language videos, high contrast option or magnifier, all of them synchronized on the same device. GVAM guides have an indoor location system that allows visitors to find their position in the exhibition space at all times and know how to reach places of interest. This system is especially useful for blind people. The GVAM guides can also offer itineraries based on time available, interests, subjects, or didactic criteria adapting its contents to other groups like children and people with mental disabilities.

Its online CMS (Content Management System) allows exporting the multimedia application not only to the GVAM mobile guide but also to all types of mobile platforms, websites and social networks. In addition the CMS has two important automatic content generators, one for synthetic speech in several languages and one for subtitles. This enables the museum staff to quickly update and extend the accessible tour guide in a more economical and efficient way.

More information: http://www.gvam.es/

V. SYNCHRONIZED SUBTITLES IN LIVE EVENTS

Tablets are also suitable devices to present synchronized subtitles that result from the real-time processes required for live subtitling in conferences and live events where a pre-recorded script is not available. Subtitling of live events is a complex and expensive process where the required immediacy limits the quality of the result in terms of content and speed. As a result, subtitle synchronization is a challenging issue of the accessibility to live-multimedia that is especially relevant as subtitles delays with regard to the audio have a disturbing effect on users that has a great impact on the audience in terms of comprehension when subtitles are presented on the screen several seconds later than audio/video. To solve this problem, University Carlos III of Madrid has developed and patented a model for real-time synchronization of subtitles and audio/video that allows subtitles generated by means of Automatic Speech Recognition tools to be displayed on screen several seconds later but individually aligned [10]. The model allows the synchronization of subtitles to audio before reproduction, compensating the individual delays produced when obtaining subtitles from speech in real-time, so that users that require subtitles may have the option to experience a quasi-live synchronised alternative. Key aspects of the proposed solution are the techniques to calculate individual subtitle delays with regard to the audio and video, and their use to create a slightly delayed version of the live television program with synchronized subtitles. One of the scenarios where this approach fits better is the use of tablets in live conferences or events, where tablet resources (screen and audio) can be used to provide elder or disabled users a synchronized version of the audiovisual scene. This synchronized version occurs several seconds later but has the advantage of subtitle to audio synchronization in a personal, non-disturbing device, while allowing people to enjoy the experience of being present at the live event together with the rest of the audience. The application of real-time subtitle synchronization in tablets to improve accessibility in live events will be felt as an improvement for an increasing
number of people, and the Spanish Centre of Subtitling and Audiodescription continues its research lines in this area.

VI. CONCLUSIONS

These experiences can be considered as a base to deal with similar situations where audiovisual and interactive accessibility resources as subtitles are created in real-time like in conferences, guided tours, etc. When combined with the automatic speech recognition and speech synthesis capabilities developed by us or already integrated in many of the today tablets, the use cases for visual and hearing impaired people are endless. Subtitling, audiodescription, voice synthesis and automatic speech recognitions are necessary complements to growing acceptance of tablets among elderly people nowadays as a support and communication tool. An example found in


Short Bio

Belén Ruiz Mezcua is Technical Director of the Spanish Center for Subtitled and Audiodescription (CESyA) under the Royal Patronage on Disability and professor at the Information Technology Department of the Carlos III University of Madrid.

José M. Sanchez-Pena
He is a full professor and head of Displays and Photonic Applications Group at Electronic Technology Dept in Carlos III University of Madrid. He is a senior member of SPIE, and a member of ILCS and leads the R&D department of Spanish Centre of Subtitling and Audiodescription.

M. de Castro, A.G. Crespo, A. Iglesias and J.L. Pajares are members of the Spanish Centre of Subtitling and Audiodescription research team, and professors at Carlos III University of Madrid.

REFERENCES


Fig. 5. Frame from "Virgina's new iPad" video.