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Fáilte (Welcome)

Message from the Taoiseach, Mr. Bertie Ahern T.D.



I would like to welcome you all to the 7th International AAATE Conference. This year the conference focuses on the theme "Assistive Technology in Shaping the Future".

This conference offers the opportunity for researchers, practitioners, users, industry and people concerned to exchange views about the latest developments in the area of Assistive Technology. These will include products, services, user's choices and advanced technologies for enabling people with disabilities to participate in their own communities. Assistive Technology grasps the challenges of an inaccessible environment and seeks solutions to overcome these barriers in empowering people with disabilities.

The large number and quality of contributions submitted shows the importance that has been attached to progress in Assistive Technology at an international level.

I wish the conference and its participants every success.

A handwritten signature in black ink, appearing to read 'Bertie Ahern'.

Bertie Ahern, T.D.,
Taoiseach

Proceedings Welcome

On behalf of the Association for the Advancement of Assistive Technology in Europe (AAATE) we are pleased to publish the proceedings of the 7th European Conference for the Advancement of Assistive Technology, "Shaping the Future". This is the 11th publication in the research series by IOS press. The publication is timely, coinciding with the European Year of People with Disabilities. Consequently, it is appropriate that we focus unambiguously on the users of assistive technology.

In order to shape the future, we must establish where we stand in the present. It is clear that technology can make an impact on the lives of people with disabilities, but this is dependent on many issues, which cannot be ignored. Within a barrier-free society, with personal assistance facilities and a user-centred service provision, AT can play a key role in facilitating independent living. There is a new generation of thinking within the area of disability, which has rejected institutionalism, discrimination and marginalisation of people with disabilities. This is a generation that is fighting for its rights as citizens and consider that legislation is just one essential ingredient. New technology, mainstreaming and independent living are important basic rights.

The Madrid Declaration of 2002 takes as a starting point the analysis of the current situation of people with disabilities in the European Union, which leads to discrimination, social exclusion and poverty. It proposes a general vision, in which disabled people are not objects of charity and patients, but independent citizens fully integrated in society. The Madrid Declaration highlights the right of people with disabilities to enjoy the full range of human rights including cultural rights, equal opportunities and access to all societal resources. The World Summit on Information Technology 2001 also advocates principles of solidarity, humanism, democracy and economic development while supporting cultural and

linguistic diversity, in order to achieve a fully inclusive and accessible global information society

New technologies are a central part of our global information society and they play an increasingly important role in our daily lives, in how we communicate, work, study or socialise. The internet, mobile phones and digital communications allow instant, global access, even to the remotest part of the world. Some people are excited by the emergence of the new global village; others are alarmed. Alarmed by the prospect of being reduced to an existence of virtual relationships, or fear that those who are older or less affluent will be excluded from this new world of technology. In the day-to-day reality of people with disabilities, it is difficult to discern any substantial impact. The dominance of technology, profession and organisation-centred approaches still permeates all sectors at European, national and local levels. It is time that we stand back and re-evaluate.

Informed choice should be the mark that assists users and their families about the services and the organisations with which they wish to engage. To date, technology-based services have largely been determined by the interests of rehabilitation and technology professionals rather than by people with disabilities themselves. However disability politics, which stems from a personal rather than professional experience of disability is exerting pressure on social and health services, propounding a powerful challenge to both professional and popular perspectives on disability. People with disabilities are insisting on their right of choice and control over the support they receive, and are pressing for change in the wider environment.

"Nothing about us without us"
- Centre for Independent Living

There are four themes central to this publication, the theme "User Centred Approaches to Assistive Technology" looks at fundamental ways in which the AT service can support a philosophy of citizenship and self governance and ensure that people with

next page

disabilities become central to the AT provision process. The theme "Interdisciplinary Approaches" explores how service providers can integrate a user-centred approach within the broad field of AT. Developing ways in which AT researchers, practitioners, funders, legislators and users can work together to achieve best practice at the stages of development and implementation across a broad spectrum of product and services. The development of standards is proving to be an essential element in removing barriers and meeting the needs of people with disabilities in the community. This is an important theme in "Standards in AT and ICT". Ireland has been a leader in this area and has published draft standards in "Delivering Disability Services". Finally, under the theme "New Technologies", the significant advances in technology research and development are investigated to determine how these can be harnessed to benefit people with disabilities, particularly within a broader life perspective of arts and culture.

This will be the largest publication of the AAATE conference to date, the response to the call for papers has been unprecedented and we would like to sincerely thank all who contributed. Unfortunately, however we could not publish all submissions. We would like to thank all who worked hard to prepare this publication, in particular the staff of Client Technical Services at the Central Remedial Clinic. We would also like to thank the IOS press for their help and patience. We are also delighted to acknowledge the patronage of Mr Erkki Lukanen of the European Commission and to acknowledge the ongoing work and support of the AAATE Board.

On behalf of the Organising Committee

Ger Craddock
Dr. Bob Allen
Co-chairpersons

AAATE Organisation

The Association for the Advancement of Assistive Technology in Europe (AAATE) are holding their 7th Conference in Dublin in 2003. Since its inception in 1995, AAATE has been in the forefront of the European research community in the development of Assistive Technology. The biannual conference gives experts in the field of AT opportunities to discuss new developments and research, strengthening European collaboration, which has been the hallmark of AAATE.

AAATE membership has significantly grown since its formation. Its sister organisations are RESNA (North America), ARATA (Australia) and RESJA (Japan). These opportunities to exchange expertise are essential to those working in the AT field.

AAATE was constituted to stimulate the advancement of assistive technology for the benefit of persons with disabilities including elderly people. Its activities include:

- * Creating awareness of assistive technology
- * Promoting research and development of assistive technology
- * Contributing to knowledge exchange within the field of assistive technology, by hosting conferences, producing the AAATE newsletter and maintaining a network of contacts throughout Europe
- * Promoting information dissemination

Conference Hosts

The Conference is being organised on a collaborative basis by the Central Remedial Clinic (CRC), University College Dublin (UCD) and Media Lab Europe.



The Central Remedial Clinic is a major national provider of assessment, therapies and other medical and non-medical services to people with disabilities throughout Ireland. Its Client Technical Services department offers user-centred evaluation, information and education in assistive technology and has played a leading role in the development and provision of AT services in Ireland.



University College Dublin (UCD) is Ireland's largest university, with over 18,000 students. Its purpose-built campus is the venue for the conference, which is conveniently located to public transport services, including Dublin airport, as well as the City Centre. UCD also hosted the Special Olympics in June 2003 – the first time this large-scale event was held outside the United States. New high quality state-of-the art accessible accommodation will be available on campus for the AAATE conference. UCD and CTS are long-time collaborators in a number of research projects, including the provision of Certificate and Diploma courses in assistive technology.

Media Lab Europe
The European Research Partner
of the MIT Media Lab

The third collaborator in the conference is Media Lab Europe, the European research partner of the MIT Media Lab in Boston, USA. Media Lab Europe is a new, Government backed project engaged in research into new areas of opportunity being opened up by new technologies. It therefore brings a fresh insight into future possibilities for people with disabilities.

Central Remedial Clinic



The Client Technical Services Department (CTS) is committed to a more inclusive society where, every person with a disability has the opportunity to develop their skills and to participate in that society to the fullest possible extent.

Staff of the CTS Department strive to achieve this by staying abreast of technological developments for the purpose of empowering the functional capabilities of people with disabilities through partnership and application of appropriate Assistive Technology.

An Assistive Technology Service was established in 1982 in the Central Remedial Clinic. The work of the department is guided by a person-centred philosophy and a recognition that assistive technology can be a channel to empowerment and equality for people with disabilities. Teamwork and collaboration are central to promoting the most practical and effective solutions to meet the needs of people who contact the service.

The interdisciplinary team of Assistive Technology Advisors brings experience from a variety of backgrounds including, engineering, information technology, occupational therapy and speech and language therapy. The professional skills of a Special Needs Advisor are incorporated into the educational assessment of children. The team operates both a centre based and national outreach service. Nationally, their work is complemented by a network of regionally based Technical Liaison Officers who are available to offer support and follow up to people in their local environments. As far as possible, the team works in partnership with local agencies to provide person centred responses.

University College Dublin



University College Dublin, founded in 1854 with John Henry Newman as its first Rector, is the largest university in the Republic of Ireland with ten faculties and over 18,000 students.


The Biomedical Engineering research group has activities in three areas, Rehabilitation Engineering, Biomedical Signal Processing and Physiological Modelling. The work of this department is mainly carried out at the Rehabilitation Engineering Research Laboratory in the National Rehabilitation Hospital, which is a unique collaborative venture between the Department of Electronic and Electrical Engineering and the Hospital. The group also has strong links with the Department of Human Anatomy and Physiology in UCD's Faculty of Medicine. The activities of the various research groups can be found on the Department 's website www.ucd.ie/eleceng

The aim of the Disability Support Service is to support students with disabilities in their studies while they attend U.C.D., to integrate the students into all areas of life in U.C.D. and to raise awareness of rights and needs of persons with disabilities throughout College and the wider community.

The Disability Support Service was set up in 1988, when UCD was one of the first third level institutions in Ireland to appoint a Disability Officer. The service has grown and evolved to meet the changing needs of students with a disability accessing third level education in Ireland today. The Disability Officer co-ordinates the services and works in co-operation with all College Departments to include the needs of students with a disability in the provision of all services within the University.

The UCD Disability Support Service is committed to providing an Equal Opportunities Learning Environment. The key objective of the Disability Support Service is to empower students with a disability to allow them full participation in University education, academically and socially. Within the Department of Electronic and Electrical Engineering, the Biomedical Engineering research group actively engages in research relevant to AAATE. The approach adopted by the group is to strike a balance between directed fundamental research and applied research.

Media Lab Europe



Media Lab Europe

The European Research Partner
of the MIT Media Lab

Media Lab Europe is a university-level research and education centre located in Dublin, Ireland. It first opened its doors on 24th July 2000 on the top floor of the nineteenth-century hopstore, part of the Guinness Brewery. The entire building and the adjacent properties are being made available by the Irish Government to form a Media Lab Europe campus in the heart of a new digital media district known as the Digital Hub.

Replicating the innovative and entrepreneurial operating model of the world-renowned MIT Media Lab, the European Research Partner will "invent the future" and adopt an interdisciplinary approach in researching the way new technologies can impact people's lives and environments. Media Lab Europe has the vision to enhance the quality of life through research and education focused on a sustainable, human-centric design in technology, science, and the arts. It is also expected to foster greater levels of innovation and entrepreneurship, initially through the development of a parallel incubator/accelerator unit called Media Lab Ventures.

This is the first time that the MIT Media Laboratory has collaborated to establish an independent centre reproducing its atelier-style and pre-competitive research culture away from its Cambridge, Massachusetts home base.

Venue for Conference

University College Dublin, Belfield is 4 km from the centre of Dublin on the south side of the city. Within the green Belfield space are also the modern facilities which a purpose-designed campus can offer. At its heart is a lake, with the O'Reilly Hall situated at its edges. With its shops, post office, bank, restaurants, sports facilities and self contained budget accommodation, the campus has matured into a village in its own right.

Dublin is renowned worldwide as a city of writers and literature, home to Joyce, Shaw and many others. As one of the oldest cities in Europe, Dublin's origins are steeped in Viking history and archaeology. Combined with the modern, which blends so elegantly with the old, you are bound to find a place to suit your taste.



Conference Information

Buildings

All conference events will take place in the Students Centre, Veterinary Building, Computer Science or the O'Reilly Hall. Please consult the map in this programme to locate all of the buildings. Signage will be visible around the campus directing you to the different locations.

Information stand

There is an information stand located in the lobby of the Veterinary Building for the duration of the conference. If you have any queries regarding the conference programme, please ask the staff there who will be delighted to help you.

Registration Desk

The registration desk is located in the lobby of the Students Centre for any queries you may have regarding your registration details, accommodation or travel plans.

Hours of opening:

Saturday, 30th August	14:00 - 20:00
Sunday, 31st August - Tuesday, 2nd September	08:00 - 17:00
Wednesday, 3rd September 2003.	08:00 - 13:00

Delegates will receive a Conference Satchel, Conference identification badge, Invitations, Conference Programme, Book of Papers and useful tourist information.

Conference Updates

To check for up to the minute conference details, please log onto our website at www.atireland.ie/aaate

Alternative Formats

The conference publication will be available in CD-Format. If you require a copy, please contact the Information Stand in the Veterinary Building.

Assistive Listening Devices

If you require a portable loop system, please contact the information stand in the Veterinary Building.

Speedtext and Interpreters

Speedtext Operators and Interpreters will be available in all plenary sessions. If you need an interpreter for any parallel sessions, please contact the information stand in the Veterinary building.

Medical Assistance

If you require medical assistance please contact the information stand in the Veterinary Building or ask one of the conference volunteers for help.

Smoking Policy

Smoking is prohibited in all conference building, except in designated areas which are clearly marked.

Messages

There will be a message board located at the Information stand in the Veterinary Building. If you require urgent assistance, please contact one of the conference volunteers.

Official Language

The official language of the conference is English.

Timing of Presentations

All presentations will begin and end on time according to the conference programme contained within. Please leave each session immediately as another group will be entering the room.

Conference Badges

All delegates must wear their badge at all times. Admittance to all sessions is by registration badge only.

Lunch

Lunch will be served in the O'Reilly Hall for each day of the conference. Please remember to wear your conference badge.

Coffee/Tea

Will be served according to location scheduled within this programme.

Social Programme

All registered delegates will be entitled to attend the Social programme. Tickets for each event can be found in your conference pack. Please ensure you bring your ticket to each event to gain entry.

Banking & Local Currency

Banks are open from 10:00 - 16:00, Monday to Friday and until 17:00 on Thursdays. There are branches of Allied Irish Banks and Bank of Ireland on Campus.

The currency in Ireland is the Euro.

Internet access

Will be available for delegates in the Computer Science Building from 09:00 until 17:00 on the 31st August, 1st September and the 2nd September. There will be a technician on site to help with any queries.

Travel within Dublin

Bus:

University College Dublin, Belfield is serviced by public transport, the No.10 bus, No.2 bus and a No.3 bus from the City Centre, (O'Connell Street) depart every 10 minutes. The 46A bus from Fleet Street to Dun Laoghaire also serves the University (Front Gate). Route 746 provides an hourly service to/from airport, passing front gate of university.

Train/Dart:

(Dublin Area Rapid Transit) rail service links the City Centre or Dun Laoghaire / Bray / Greystones to Sydney Parade Station which is the terminus for the No.2 and No.3 bus to the campus.

Car Parking:

If you are travelling to UCD by car, you must enter through the Stillorgan gate to park in Carpark 2 for the O'Reilly Hall or via the Clonskeagh entrance to park in Carpark 1 for the Student Centre. The Organising Committee will not be responsible for the security of cars. Clamping is in operation for illegal parking throughout the city, beware of restrictions.

TAXIS:

There are usually an adequate number of taxis in operation in the city centre at any given time. It is possible to hail a taxi from the street, but convenient taxi ranks are located outside Wynn's Hotel on Middle Abbey Street, opposite the Virgin Megastore on Aston Quay, and opposite the Bank of Ireland on Dame Street. The fare to UCD is approximately €10/€12, depending on traffic and the time of day.

Southside Cabs:	71, St.Laurences Park, Stillorgan	(01) 283 6622
Local Cabs:	54, Main St., Upr. Dundrum, Dublin 14	(01) 298 8444
Pony Cabs:	Donnybrook	(01) 269 1000
Pony Cabs:	Ranelagh/Rathmines	(01) 496 6777
National Radio Cabs:	City wide	(01) 677 2222

Scientific Programme

With over twenty topics to cover, the scientific programme will offer great opportunity for discussion and debate. It will consist of plenary and parallel sessions from leading guest speakers and invited papers delivered by delegates. During the conference there will be workshops and demonstrations.

Topics for Papers:

- Access to the Information Society
- Assistive Technology in Education & Training
- European Infrastructure in the field of Assistive Technology
- Design for All/Universal Design
- User Empowerment
- Community Networks
- Augmentative & Alternative Communication
- Development of Assistive Technology for Independent Living
- Improving Quality of Assistive Technology
- Assistive Technology in the Workplace
- Assistive Technology for Children
- Assistive Technology for Older Adults
- Assistive Technology for the Activity of Daily Living (ADL)
- Assistive Technology for Restoration and Enhancement of Function
- Assistive Technology for Mobility
- Socio-economic Evaluation
- Issues of Human/Machine Interaction
- Changes in Social Systems and Service Delivery
- Industrial Competitiveness and Technology Transfer
- Education and Training in Assistive Technology

Scientific Committee

Wolfgang ZAGLER	Austria
Klaus MISENBURGER	Austria
Jan ENGELEN	Belgium
Dominique ARCHAMBAULT	France
Christian BÜHLER	Germany
Georgis KOUROUPETROGLOU	Greece
Costas STEPHANIDIS	Greece
Bob ALLEN	Ireland
Des KENNY	Ireland
John GILLIGAN	Ireland
Richard REILLY	Ireland
Ger CRADDOCK	Ireland
Gary McDARBY	Ireland
Annraoi dePAOR	Ireland
Niall KEANE	Ireland
Donie O'SHEA	Ireland
Donal TOOLIN	Ireland
Mick MCCABE	Ireland
Martin NAUGHTON	Ireland
Gerry ELLIS	Ireland
Ann JACKSON	Ireland
Martine SMITH	Ireland
Patricia NOONAN WALSH	Ireland
Simon HALL	Ireland
Donal MCANANEY	Ireland
Lawrence NORMIE	Israel
Renzo ANDRICH	Italy
Pier LUIGI-EMILIANI	Italy
Oivind LORENTSEN	Norway
Knut NORBY	Norway
Luis AZEVEDO	Portugal
Leonor MONIZ PEREIRA	Portugal
Dusan SIMSIK	Slovakia
Crt MARINCEK	Slovenia
Julio ABASCAL	Spain
Jan Ingvar LINDSTROM	Sweden
Margita LUNDMAN	Sweden
Harry KNOPS	The Netherlands
Mathijas SOEDE	The Netherlands
John GILL	United Kingdom
Alan TURNER SMITH	United Kingdom
William S, HARWIN	United Kingdom
Helen PETRIE	United Kingdom
Jeff COHN	USA
Caren SAX	USA
Marcia SCHERER	USA
Robert JAEGER	USA

Social Programme

Saturday 30th August 2003

20:00 - 21:30 Welcome Reception in Students Centre including drinks, savouries and entertainment
(cost incl. in Registration Fee).

Sunday, 31st August

09:00 - 10:15 Official Opening

14:00 - 16:30 Tour A: Panoramic City Tour: Optional €25
See all the major sights and hear the history and folklore of the city on this delightful coach tour with top local English speaking guide.

19:30 - 20:30 Civic Reception hosted by The Lord Mayor of Dublin

20:30 - 22:30 Irish Evening in the Students Centre

Monday, 1st September

09:30 - 13:30 Tour C: North Coast Tour Optional €30
We drive along the north coast with your English speaking guide to Howth Head the highest point on Dublin Bay, past the fishing village of Howth and continue on the coast past the world-famous Portmarnock Golf Course to the charming village of Malahide. Here we visit historic Malahide Castle to enjoy the history, art and antiques of this important castle in Irish history.

20:00 - 21:30 State Reception in Royal Hospital Kilmainham
Hosted by Irish Minister for Health
Including drinks and savouries
Transport will be provided.

Tuesday, 2nd September

19:30 - 20:00 Drinks Reception in O'Reilly Hall, UCD

20:00 - 23:30 Conference Banquet in O'Reilly Hall, UCD
Including entertainment.

Wednesday, 3rd September

Free for shopping after lunch.

Schedule-at-a-Glance

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Saturday 30th August

14:00 - 20:00	Registration	Students Centre
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Sunday 31st August

08:00 - 17:00	Registration	Students Centre
09:00 - 09:45	Opening Ceremony	Astra Hall, Students Centre
	Mr Bertie Ahern, T.D., Taoiseach Dr Caroline Hussey, Registrar, UCD Mr. Ger Craddock, Central Remedial Clinic, Dublin Dr. Bob Allen, Manager of Assitive Technology, Central Remedial Clinic, Dublin Dr. Gary McDarby, Media Lab Europe	
09:45 - 10:15	Presidential Address	Astra Hall, Students Centre
	Mr. Renzo Andrich, AAATE Europe	
10:15 - 10:30	Coffee/Tea	Students Centre
10:30 - 12:00	1st Plenary Session	Astra Hall, Students Centre

Chairperson: Dr. Bob Allen

Shaping the Future

Shaping the Future with Assistive Technology

Harry Knops (Netherlands), Vice President AAATE

Paradigm Shifts Shape the Future, Design for All in Service of Sustainability

Paivi Tahkokallio (Finland), European Institute of Disability & Design

From Information Age to the Inclusive Age; The Economic Imperative for Inclusion

Gerry Ellis (Ireland), European Disability Forum

12:00 - 13:00	Launch of Trade Exhibition AAATE Trade/ Technical Exhibition	O'Reilly Hall
13:00 - 14:00	Lunch	Conservatory
14:00 - 15:30	2nd Plenary Session Chairperson: Martin Naughton <i>Standards in Information & Computer Technology</i> Disability Standards Mary Van Lieshout, Head of Research & Standards, National Disability Authority of Ireland Driving European Policy at a National Level Dr. Bob Allen, Manager, Assistive Technology, Central Remedial Clinic Crossing the ICT gap for People with Disabilities Dr Yvette Marrin (USA), Comptia / National Cristina Foundation The next hot item for assistive technology and design for all: standardisation Professor Jan Engelen (Belgium), Katholieke Universiteit Leuven	Astra Hall, Students Centre
15:30 - 16:00	Coffee/Tea	O'Reilly Hall
16:00 - 17:30	Parallel Sessions	Veterinary Building
	A) Design for All - National Initiatives	Room 1
	B) AT & Older People - Dementia	Room 2
	C) Assistive Technology for Sensory Impairment - Visual #1	Room 3
	D) Assistive Technology for Education & Training - Primary Users of AT	Room 4
	E) Humans - Machine Interaction: Interface Issues	Room 5
18:00 - 19:00	Plenary Speakers, Scientific Committee & ICTA Member Reception	Student Centre, Blue Room
18:00 - 19:00	AAATE New Attendees Reception	Student Centre, Upstairs Bar
20:00 - 22:30	Irish Night Civic Reception hosted by Fáilte Ireland	Students Centre, Bar

Monday 1st September 2003

09:00 - 10:30	3rd Plenary Session Chairperson: Donal Toolin User Centred Approaches to Assistive Technology From patient to customer, direct payments for assistive technology Adolf Ratzka (Sweden) Co-founder of the European Network for Independent Living The Challenge of Creating User Centred Organisations Dr. Donal McAnaney (Ireland) Director of Research & Innovation, Rehab International Ger Craddock (Ireland) Manager, Client Technical Services, Central Remedial Clinic, Dublin	Astra Hall, Students Centre
10:30 - 11:00	Coffee/Tea	O'Reilly Hall
11:00 - 12:30	Parallel Sessions	Veterinary Building
	A) Access to the Information Society	Room 1
	B) New Technologies & Innovation	Room 2
	C) Assistive Technology for Support & Care	Room 3
	D) Assistive Technology & the Environment	Room 4
	E) Assistive Technology for Sensory Impairment - Visual #2	Room 5
12:30 - 13:30	Lunch	Conservatory
12:30 - 13:30	Forum of Institutes Lunch	Robing Room, O'Reilly Hall
13:00 - 13:30	European Design For All & eAccessibility Network Launch	Conservatory
13:30 - 15:00	Parallel Sessions	Veterinary Building
	A) Assistive Technology for Mobility - Control Systems	Room 1
	B) Service Delivery - Process	Room 2
	C) AAC - Hardware & Software	Room 3
	D) Design for All - User Centred Approaches	Room 4
	E) Assistive Technology & Older Persons	Room 5
15:00 - 15:30	Coffee/Tea	Conservatory
15:30 - 17:00	Parallel Sessions	Veterinary Building
	A) Service Delivery - Innovations in Practice	Room 1
	B) Assistive Technology for Mobility - Assessment & Evaluation	Room 2
	C) Smart Homes #1	Room 3
	D) Education & Training	Room 4
	E) Outcomes in Assistive Technology	Room 5
17:15 - 19:15	EDeAN National Contact Centres Meeting (Closed)	Veterinary Building
17:15 - 19:15	ATIIOC Meeting	Veterinary Building
20:00 - 21:30	State Reception Mr. Michéal Martin, T.D., Minister for Health	Royal Hospital Kilmainham

Tuesday 2nd September

08:00 - 09:00 HPT Sig Meeting Students Centre, Blue Room

09:00 - 10:30 4th Plenary Session Astra Hall, Students Centre

Chairperson: Klaus Miesenberger

Interdisciplinary Practice

Delivery Assistive Technology in the Community: An Interdisciplinary Approach

David Gray (USA), Associate Professor of Neurology and Associate Professor of Occupational Therapy at Washington University School of Medicine in St Louis, Missouri.

Trends in Software Accessibility

Bill Haneman (Ireland), The GNOME Foundation, Sun Microsystems

Interdisciplinary Practice in Rehabilitation

Prof. Wim Van Heuvel (Netherlands), Director of IRV

10:30 - 11:00 Coffee/Tea Conservatory

11:00 - 12:30 Parallel Sessions Veterinary Building

A)	Remote Service Delivery	Room 1
B)	AAC & the Internet	Room 2
C)	Biomechanics	Room 3
D)	Product Development & ECU	Room 4
E)	AT & Older Persons #2	Room 5

12:30 - 13:30 Lunch O'Reilly Hall

12:30 - 13:30 International Committee Lunch Robing Room, O'Reilly Hall

13:30 - 15:00 Parallel Sessions Veterinary Building

A)	User Involvement	Room 1
B)	Hearing Impairment	Room 2
C)	Robotics	Room 3
D)	Service Delivery - National Initiatives	Room 4
E)	Assistive Technology for Play & Involvement	Room 5

15:00 - 15:30 Coffee/Tea O'Reilly Hall

15:30 - 17:00 Parallel Sessions Veterinary Building

A)	Interdisciplinary Practices	Room 1
B)	Design for All - Product Development	Room 2
C)	Initiatives in Environmental Controls	Room 3
D)	Assistive Technology for Rehabilitation	Room 4
E)	Interface Issues - Computer Access	Room 5

17:15 - 19:15	AAATE AGM	Computer Science Theatre
19:30 - 20:00	Pre-dinner Drinks Reception	O'Reilly Hall
20:00 - 23:30	Conference Banquet	O'Reilly Hall

Wednesday 3rd September 2003

09:00 - 10:30	5th Plenary Session Chairperson: Harry Knops eInclusion Emerging Perspectives in AT Mr. Per Blixt DG-INFISO, European Commission, Head of Unit, "Elderly and Persons with Disability" Project Developments in the E.U. Mr. Gunner Fagerberg, European Commission Principal Scientific Officer, "Elderly and Persons with Disability" Access to Assistive Technology in the European Union: European Commission Study Mr. Frank Marx, Project Manager, DG Employment & Social Affairs	Astra Hall, Students Centre
10:30 - 11:00	Coffee/Tea	Students Centre
11:00 - 12:30	6th Plenary Session Chairperson: Richard Reilly New Technologies Affective Feedback: Learning skills in the virtual world for use in the real world Dr. Gary McDarby, Media Lab Europe Youth Culture and New Technologies Dr. Lizbeth Goodman, SmartLab (UK) Information Technology, Telecommunications, New Media and Disability: Future Trends Pier Luigi Emiliani , Director- CNR, (Italian National Research Council), IFAC (Institute of Applied Physics)	Astra Hall, Students Centre
12:30 - 13:00	Conference Closure	
13:00 - 15:00	European Design for All e-Accessibility Network (Open Meeting) This event is open to all interested conference participants.	Veterinary Building
15:00 - 19:00	D4All Net Consortium Meeting (closed meeting)	Students Centre

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Parallel Session A

Design for All - National Initiatives

Date: Sunday 31st August 2003

Time: 16:00 - 17:30

Venue: Veterinary Building - Room 1

Chairpersons: Costas Stephanidis and Bryan Boyle

Towards accessible telecommunication services for inclusive information society in Slovenia

Authors: Matevz Pustisek, Iztok Humar, Janez Bester and Crt Marincek

In order to facilitate the bridging among the service providers and users with special needs and elderly in the field of inclusive information society, a national project was launched focusing on specification of new telecommunication services and a proposal for deployment by service providers, design of pilot services and their evaluation by the target groups.

Partners in this 3-year project are the Institute for Rehabilitation and the Faculty of electrical engineering, both COST219 members. In the first phase several viable but not yet widespread technologies will be analysed: set-top-boxes, e-learning system and video conferencing. Methodology for evaluation was established and evaluation of set-top-boxes conducted. The results show that technology is not the key limiting factor in service adoption.

Based on the project results a set of services and recommendations for their introduction will be prepared, helping Slovenian service providers, which are rapidly introducing new broadband and mobile services, to apply the design-for-all approach and thus to make their services more accessible.

Alliance for barrier free Information Technology, Germany

Author: Christian Bühler

Today, access to PC and information systems like Internet

and Intranet are recognised as one necessary condition for participation in the information society including the work place. This general requirement is of course important for the vocational rehabilitation and integration of people with disabilities. In this respect, the W3C-WAI content guidelines (WCAG) have been accepted as a general and global, factual standard for access in this domain by experts.

The eAccessibility expert group and the EU have made the general recommendation to adopt WAI guidelines, specifically WCAG 1.0, in a communication (COM2001 529 final: eEurope 2002: Accessibility of Public Web Sites and their Content, Brussels 25.9.2001). Besides a formal adoption as in regulation or legislation the actual implementation in practise will make the difference.

Therefore, in Germany after a legislative adoption an implementation support measure has been established on the basis of existing initiatives. This alliance for barrier free information technology (Aktionsbündnis barrierefreie Informationstechnik - Abl) has been started in September 2002 with support of the federal government (Federal Ministry for Health and Social Security - BMGS). In cooperation with its partners Abl offers education, web-based information, etc. to support the implementation.

Usability techniques for accessibility: Pro's, Con's

Author: Marie Markowski

This paper provides an overview of the importance of usability in relation to accessibility, including testing techniques and example outputs. The paper discusses the pro's and con's of various accessibility testing techniques such as heuristic evaluation, expert reviews and user testing. It also explains the advantages and pitfalls of contextual user testing and why it is the most comprehensive approach to take.

This paper is based on the experiences of Serco Usability Services when carrying out accessibility and usability testing. It explains why usability and accessibility must be considered side by side, as usability issues tend to occur for able-bodied users as well as disabled users once accessibility concerns are dealt with.

aCMF - An Accessible Content Management Framework

Authors: Andreas Hochgatterer and Florian Grasel

It is state of the art to develop web sites to meet the web accessibility standards provided by the W3C. Efficient tools, meeting these standards to support the process of web design and content management, are not available. These tools would create a powerful opportunity to empower and to enable software developers to create and manage content by themselves.

At the ARC Seibersdorf research GmbH a prototype of an accessible Content Management Framework (aCMF) has been developed in close cooperation with the FH Wiener Neustadt and user groups. The aCMF represents one optimal and efficient toolkit for content management and Web site creation for users with disabilities (e.g. for blind users) in comparison to available tools and methods.

National Disability Authority IT Accessibility Guidelines version 1.1

Author: Brenda Delaney

This paper introduces the National Disability Authority IT Accessibility Guidelines version 1.1 It discusses the need for and the background to these guidelines and explains the development process, the structure and the content of the guidelines

This paper is accompanied by a video, which highlights the barriers experienced by people with disabilities in their everyday use of ICT. Delivery of this paper includes this video and an online demonstration of the guidelines.

Parallel Session B

AT and Older People - Dementia

Date: Sunday 31st August 2003

Time: 16:00 - 17:30

Venue: Veterinary Building - Room 2

Chairpersons: Mick McCabe and Bob Martin

European infrastructure for assistive technology: Factors affecting the delivery and uptake of assistive technologies by people with dementia as investigated in the ENABLE project.

Authors: Petrina Duff, Emer Begley, Suzanne Cahill, Päivi Topo, Kristiina Saarikalle, Torhild Holthe, Knut Engedal, Jurate Macijauskienė, Kerry Jones and Jane Gilliard

As part of the cost-benefit analysis work for European funded ENABLE project, an investigation of the possible factors affecting the future delivery and uptake of assistive technologies amongst people with dementia and their carers in five different countries was performed. This paper will report on the results of this activity. Several factors were investigated including the prevalence and incidence of dementia; the economic costs of dementia care for the public and private sector; current models of dementia care including assistive technology delivery systems; reimbursement and funding procedures available for assistive technology; and recent policy initiatives that may affect assistive technology uptake amongst this disability group. Each of these factors are likely to impact quite significantly on the assistive technology market for people with dementia and to change health authorities and carers uptake and investment in assistive technologies for this population group in the near future.

A Design Methodology for Assistive Technology for People with Dementia

Authors: R. Orpwood, R. Faulkner, C. Gibbs and T. Adlam

Dementia has increasingly become accepted as a disability, and this acceptance has encouraged the development of assistive technology for people with dementia. The preferred method of designing assistive technology is for a

user-led approach that involves disabled people themselves in the design process.

However for devices for people with dementia this approach is complicated by the practical and ethical problems of involving this user group in exploratory work. The Bath Institute of Medical Engineering has been designing support equipment for the EC ENABLE project and for the Gloucester Smart House.

This paper outlines a user-led design methodology for people with dementia that has resulted from this activity. It includes a description of the effectiveness of developing technology that emulates the strategies adopted by personal carers. It also shows the value of involving these carers in an intermediate stage of development before exposing the technology to people with dementia.

Developing Assistive Technology for People with Dementia Adaptation of Design for All Principles

Authors: Sidsel Bjoerneb , Petrina Duff and Outi Maki

In the Enable Project new devices are being developed with the particular aim of enabling people with dementia to live more independently and to support their well-being by providing positive experiences, reducing worry and unrest, and also by reducing the burden on family carers. This presentation will describe how general Design for All principles were used, adapted and extended to meet the needs of people with dementia.

The User Requirements report was used in the project to choose and adapt new devices and to choose existing devices that are being tried by users in six countries up to one year.

After the user trials, the User Requirement Report will be revised and made public, for the benefit of end users and all who are interested in assistive technology for people with dementia.

Technology, Dementia and Quality of Life: Hearing the Individual's Voice

Authors: S. Cahill , E. Begley, and K. Jones

While it is generally agreed that any appraisal of quality of life should as far as possible rely on the individual's own

perspective, asking people with dementia to evaluate their own quality of life remains a much debated issue. This paper reports preliminary findings from phase one of a longitudinal study (Enable) designed to examine the impact of assistive technology on persons with dementia and their family caregivers. Phase one of the study was carefully designed to empower people with dementia by engaging them in the research process and by asking them questions about their own quality of life before assistive technologies were introduced into their homes.

Results demonstrate that people with dementia can ably participate in research studies and have more positive appraisal of their lives, roles and relationships than might be expected. Findings are discussed in the context of social policy and the potential assistive technology has for improving quality of life.

Parallel Session C

Assistive Technology for Sensory Impairment - Visual #1

Date: Sunday 31st August 2003

Time: 16:00 - 17:30

Venue: Veterinary Building - Room 3

Chairpersons: Belinda Davis and John Gill

Conversion Tools for DAISY 3.0 / NISO Z39.86-2002

Authors: Guillaume du Bourguet and Dominique Burger

Since March 2002, DAISY 3.0 / NISO Z39.86 has emerged as a de facto XML standard for markup of digital talking book and as a basis for a new generation of Braille printing tools.

In this paper we describe a set of tools and procedures around dtbook XML DTD.

We demonstrate a Microsoft Word based system to markup plain text or to convert old-style markup texts semi-automatically to dtbook XML DTD.

XSLT stylesheets are used to:

- convert from XML publishers own format to dtbook
- convert from upCast[*] (RTF derived DTD) to dtbook
- convert from dtbook to XHTML

[*] upCast is a product by Infinity Loop (<http://www.infinity-loop.de>)

A set of XSLT stylesheets has been made available on the DAISY Open Source Initiative web site. <http://dsidtb.sourceforge.net/stylesheets/>

This document needs a good understanding of what is an XML document.

GRAB: A new haptic and audio virtual environment enabling vision impaired people to access the three-dimensional computer graphic world

Authors: Mark Magennis, Bláithín Gallagher, John Wood, Elena Cano Arias, José Muñoz, Keith Gladstone, Helen Graupp, Teresa Gutierrez, Carlo Avizzano and Massimo Bergamasco

The increasing use of computer graphics for interacting with information excludes many vision impaired people from many ordinary activities. Haptic interaction mechanisms can exploit the sense of touch to enhance or replace vision, but single point haptic devices have so far not proved very useful to blind people due to certain limitations. GRAB is a Haptic & Audio Virtual Environment (HAVE) which integrates a novel two-point force feedback device with a haptic audio geometric modeller. The benefits of GRAB include larger forces, high fidelity representation, large zoomable workspace and audio assistance. Initial evaluations indicate that the new GRAB HAVE surmounts some of the known problems with haptics. The creation and testing of a virtual reality game has demonstrated the suitability of the HAVE for developing real applications.

Further applications currently in development include the exploration and manipulation of financial graphs and charts generated from live data and the navigation of city maps.

Technological tools and challenges in the tactile adaptation of images

Author: Nicole Trudeau

Technological tools do not yet solve problems of the tactile adaptation of images. More and more individuals, organisations and businesses are interested in tactile material to allow blind and visually impaired people to have increased access to information, communication and learning.

These tools should enable the producers and their collaborators to work with two types of documents: - documents specifically designed for tactile exploration; and secondly documents specifically designed for visual reading but adapted to allow tactile exploration. It is the latter type of documents, those designed for visual reading but adapted to allow tactile exploration, which will be the subject of my presentation. In the current research, the ultimate objective

is the normalisation of tactile graphics.

The project is at the visual image analysis phase, the phase preceding production. The resulting methodology should be an instrument of reference for understanding the visual structure of a work and should influence some choices for the production of tactile material.

Document Format and Layout for Blind People: An Analysis of the Problems and some Possible Solutions

Authors: D. G. Evans, S. H. Kurniawan and P. Blenkhorn

This paper describes the problems faced by blind people in the formatting and layout of documents produced using word processors. It summarises the results obtained from an analysis of a corpus of documents produced by blind authors and the evaluation of a prototype document checking tool that was designed to assist blind authors in the creation and checking of documents. Based on this experience the paper then considers some of the issues that cause blind authors problems and indicates how these might be best addressed.

Approaches to Voice Interaction Systems for Use by Visually Impaired people

Authors: Keith Gladstone, Elizabeth Dixon, Rachel Pick and Tara Alexander

With the convergence of computers and telecommunications, advanced technologies can present new opportunities to overcome accessibility barriers for disabled users. In this paper, we look at different approaches to voice interaction as used in three EU IST projects, and examine how accessible and usable these approaches are for visually impaired people.

VISUAL is incorporating voice synthesis and recognition in the interface of an e-learning portal and web-authoring tool.

IMAGINE is developing an interface that allows interaction with electronic business applications via natural language from mobile devices and other appliances.

FASIL is aiming to provide a natural voice interface to personal applications such as email, calendar and contacts. The paper addresses the different technical approaches as they affect users.

A transcription tool for mathematical Braille

Authors: Moço Victor and Archambault Dominique

In the framework of the Vickie project, funded by the European Commission, which aims to provide tools facilitating inclusive education for visually impaired children, we have developed a tool allowing automatic transcription of Mathematical formulas.

This tool is based on a central representation of the formula, in order to separate input from output, that facilitate the integration of new formats (the mathematics Braille notation is not international). Indeed for each format we need a parser to create this representation and an output module to generate a formula from the internal representation.

A prototype was developed in Java that includes major features and is able to process mathematical contents up to the middle of secondary school. Latex, MathML and French Mathematical Braille are supported. It also allows the user to select a Braille table. A website allows use of this prototype.

Parallel Session D

Assistive Technology for Education and Training - Primary Users of AT

Date: Sunday 31st August 2003

Time: 16:00 - 17:30

Venue: Veterinary Building - Room 4

Chairpersons: Ann Jackson and Alan Turner Smith

The Adaptive Learning Environment: Customising the System to the Users Accessibility Needs

Authors: S. J. Schofield, N. A. Hine, J. L. Arnott, S. Joel, A. Judson and R. M. S. Rentoul

Computer-delivered educational material has great potential for customisation to meet the requirements of individual users, in particular students with disabilities. An adaptive learning environment (ALE) is a system which analyses the student's performance at each stage, using the results to generate the next section's content. This has always been the practice in traditional teaching, but is expensive in resources and dependent on the teacher's skills and experience. Automating this process offers consistency of quality and flexibility.

This paper discusses how a set of user characteristics relating to disabilities can be recorded on registration to an ALE. It outlines how this profile can be used to modify the interface's appearance, improving accessibility for the user, and investigates how meta-tagging the learning objects in the ALE with accessibility tags can further tailor the material delivered. Finally, the paper discusses the implications to computerised assessment of students with disabilities.

Enhanced Learning Opportunities for School Students with Disabilities: Pedagogic and Technological Issues

Authors: R. M. S. Rentoul, N. A. Hine, J. L. Arnott, S. Joel, A. Judson, S. Schofield and K. J. Topping

Information and communications technology has the potential to enhance the life of students with disability by

facilitating their opportunities for growth, development and inclusion. However, the full potential of such technologies is unlikely to be achieved without concurrent changes in pedagogical practice. Pedagogical practices such as peer-assisted, cooperative and collaborative learning all have great potential for synergy with information and communications technology to benefit students with disabilities.

This paper discusses the application of emerging technology and connected pedagogical issues in the specific context of educational field trips. The RAFT (Remote Accessible Field Trips) project is used as an exemplar to demonstrate future directions.

Improving the employment prospects of severely physically disabled persons through IT training within a mainstream college

Authors: Aejaz Zahid and Mark Hawley

Comprehensive training in the use of both computer access technology and the personal computer itself are equally important in order to prevent the abandonment of the Assistive Technology provided. Improving the employment prospects of severely disabled persons resident in one of the most economically deprived parts of Europe is also a multifaceted task and requires an interdisciplinary approach.

This paper describes the development and outcomes of a training initiative set up at a community college in Barnsley to help individuals with severe physical disabilities both develop their IT skills and improve their employment prospects.

The Role of Assistive Technology in the Provision of Educational Material for Children with a Visual Impairment in the Republic of Ireland

Author: Ilka Stäglin

The following article is a small piece of baseline statistical research in connection with a report on the services provided by the National Braille Production Centre, Ireland. It focuses on the role of Assistive Technology (AT) in an educational setting on the user and the producer side. This is limited to primary and secondary education (special and mainstream schools) and is largely based on a survey

conducted by the National Braille Production Centre among its client base.

It is shown that AT is available in many schools and that the children with a VI report definite preferences and dislikes for certain AT aids. However, there is a lack of a co-ordinated implementation and training in the appropriate use of AT. This might eventually counteract the intended function of helping inclusion in education.

ICT a Tool for Play and Communication?

Author: Peg Lindstrand

The purpose with this study was to give parents of children with severe and multiple disabilities a possibility to describe their experiences and expectations of the computer as an aid. The main interest is to better understand what factors interact to make a tool like ICT become an aid for play and communication.

The starting point, and the general idea with this study, is that the conversation between different groups and levels in society must be seen as central for a development in the area of "children with disabilities and new technology" to be possible.

Parts of interviews with seven families of children with severe and multiple disabilities will be presented in this session.

Graphical information for students with visual impairments at technically oriented faculties

Authors: Alena Galajdova and Dusan Simsik

The paper describes work on collection of different technologies for efficient study of technical courses at the technically oriented faculties. Problems with graphic information for blind students in the technical field of study is one of the main barriers to overcome during their study.

As we have blind students at the Technical University of Kosice we have been forced to set up a good combination of technology to offer proper information and knowledge in as accessible a way as possible. Different methods are described with reference to a particular course and type of information. Experiences and results are discussed.

Parallel Session E

Human - Machine Interaction: Interface Issues

Date: Sunday 31st August 2003

Time: 16:00 - 17:30

Venue: Veterinary Building - Room 5

Chairperson: Lawrence Normie

Eye Blinks for Control [Case Study]

Author: Neil Gregory

This is a case study of a man, Ron, who had a brain-stem stroke and is limited to only being able to eye blink. Various technologies have failed in the past to help Ron communicate using a high-tech method. Recent advances in facial recognition and the feasibility of using a non-expensive webcam to capture images has led to the development of software that can enable Ron to access AAC and Environmental Control.

We have tried eye blink systems and EMG systems without success. This led us to use the vision-based perceptual technology developed at NRC-CNRC[1], which is claimed to have the most reliable eye blink detector to date. This detector recognises Ron's eye blinks using an off-the-shelf webcam in front of Ron's face. This makes it possible for Ron to send commands to a computer by blinking. In this case study, we detail Ron's case giving an up-to-date picture of the technological developments.

Free Software and Open source in the field of Assistive Technologies

Author: Dominique Archambault

In recent times, an increasing amount of software is distributed under open source licenses. The most famous instances certainly Linux and Mozilla, but it is a fact that they are followed by lots of smaller projects.

Indeed, Open source distribution has numerous benefits, both to the end users and to the developers of the

software. It allows the creation of communities that involve users, as well as developers, in the development process.

Furthermore, it may allow the development of economic activity (added value like installation packages, related tools or helplines can be implemented). This paper presents the Open source ideas and rules. Following this, the application of this philosophy to the field of Assistive Technologies will be discussed, focusing on the particular relevance of this field where users and developers are used to working with each other.

An evaluation study of two-button scanning with ambiguous keyboards

Authors: Karin Harbusch and Michael Kuhn

In communication using Augmentative and Alternative Communication (AAC) aids, scanning volunteers an effective method to users who can operate at most three buttons. In this paper, we investigate scanning with ambiguous keyboards. Using an ambiguous keyboard means that words are entered by pressing the corresponding ambiguous key once for each letter. The user disambiguates the typed code by selecting the intended word in a list of words of the same length as the code provided by the system.

Additionally, the list may contain predictions where the code is supposed to be a valid prefix of a suggestion. In both cases, the suggestion list, the user selects the intended word from, is extracted from a large lexicon. Our study comprises an evaluation for various layouts of ambiguous keyboards which out-perform two nonambiguous keyboard layouts with respect to the number of scanning steps in a two button mode.

STARDUST; Speech Training And Recognition for Dysarthric Users of Assistive Technology

Authors: Mark Hawley, Simon Brownsell, Stuart Cunningham, Peter O'Neill, Pam Enderby, Mark Parker, Rebecca Palmer, Phil Green, Athanassios Hatzis and James Carmichael

Automatic speech recognition (ASR) can provide a rapid means of controlling EAT. Off-the-shelf ASR systems function poorly for users with severe dysarthria because of

the increased variability of their articulations compared to 'normal' speech. A two-pronged approach has been applied to this problem:

1. To develop a computerised training package which will assist dysarthric speakers to improve the recognition likelihood and consistency of their vocalisations.
2. To develop speech recognition systems which have greater tolerance to variability of speech utterances.

We present results of trials to evaluate the effect of the speech training aid on the speech of dysarthric individuals. Initial results have shown good speech recognition rates for people with even the most severe dysarthria. Speech command driven environmental control systems and voice output communication aids are being developed.

ECDL PD: A Standard Certificate for All

Authors: Klaus Miesenberger, Andrea Petz and Denise Leahy

Due to the increasing importance of IT (information technology) skills certification in the labour market, persons who are unable to avail of opportunities to achieve the recognised and accepted level of competence and the according certificate are likely to be at a disadvantage. People with disabilities are confronted with additional barriers. Although they might have the skills required, they are not able to get hold of the certificate due to accessibility problems.

In consequence they can not follow the established procedures to show their competence and are often not taken into consideration for certain jobs. This paper presents the ideas and the work done so far in the EU (Leonardo da Vinci Program) funded project ECDL-PD (European Computer Driving Licence for People with Disabilities) aiming at making the ECDL (European Computer Driving Licence) certificate accessible to people with disabilities and thereby a tool to foster the vocational integration of people with disabilities.

FASTY - Faster and easier text generation for disabled people

Authors: W.L. Zagler, C. Beck and G. Seisenbacher

The partially EU funded project FASTY will assist motor, speech, learning and language impaired persons to produce texts faster, with less physical/cognitive load and with better spelling and grammar. Higher text generation rates will be achieved on one hand by using a very adaptable User-Interface with a variety of feedback options such as different selection lists and orders for the predicted words/phrases, different audible feedback options and synthetic speech output.

On the other hand a very strong prediction engine, which is independent from the used language, is developed. Based on n-gram methods the engine will use Part-of-Speech statistics, grammar-based prediction and prediction ranking and collocation-based prediction, too. Furthermore, a new technique for compound prediction will enhance the keystroke-saving rate for some languages.

The paper will give a general introduction to the project and a status report on prototypes. First results of language performance tests will also be presented.

Parallel Session A

Access to the Information Society

Date: Monday 1st September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 1

Chairperson: Mathijas Soede

Taking ABLEDATA Web Site Into The 21st Century

Author: Stephen W. Lowe

Since 1996, ABLEDATA has been steadily growing as one of the world's premier Internet resources for assistive technology (A.T.) information. The project is best known for maintaining the most comprehensive database of assistive products available in the United States.

The database of assistive technology has always been searchable from the ABLEDATA Web site (www.abledata.com); however, many other types of this information could only be found by browsing the site—e.g., disability organisations, disability-related conferences, news items relating to A.T., classified advertisements for assistive products, and product reviews.

In 2003, we are creating a database back end for the ABLEDATA site that will place all of these resources into a relational database. Leveraging this new foundation, we will introduce new functionality to enhance the ABLEDATA site's usability and accessibility.

Assessing the Research Knowledge Base in Assistive Technology: A Case Study Using MEDLINE

Author: Robert J. Jaeger

MEDLINE is the largest freely available database in the world that includes research citations for Assistive Technology (AT). This paper presents a preliminary assessment of the AT knowledge base in the MEDLINE system. The phrase assistive technology is not a defined search term in MEDLINE. We present examples of search

strategies, estimates of the numbers of AT citations in MEDLINE, the journals most likely to contain articles related to AT (and their journal Impact Factors), and the growth of citations in AT over time.

We also present suggestions to search MEDLINE, as well as mechanisms to maximise the probability that future publications will be retrieved from MEDLINE. Finally, suggestions are presented for possible future modifications of the MEDLINE controlled vocabulary, based on terminology used in existing AT classifications schemes, such as ISO 9999.

The public library - how to include people with disabilities

Authors: Aina Olsen og and Randi Roed Andersen

To assure Norwegian citizens their democratic right to information and knowledge, an important goal of the Norwegian Archive, Library and Museum Authority is to increase the accessibility of public library services. This paper presents the work of the project "The Accessible Library". Its aim is to transform three public libraries to well-adapted areas of knowledge, to meet and work for people with disabilities.

A holistic approach is adopted although the main focus is on access to the Internet. This work is the result of a co-operation between governmental institutions at both their democratic right to information and knowledge, a national and local levels.

Construction of the Database of International Version on Research Titles Reported in the Annual Meetings of the Rehabilitation Engineering Society of Japan

Authors: Shinichiro Gondo, Shuichi Iwamoto and Michio Morishita

Topics presented in the Rehakogaku Conference, the annual meetings of the Rehabilitation Engineering Society of Japan (RESJ) since 1986, were collected in the database for use on Windows. Two panels of search windows were prepared, the one for the combination of search conditions and the other for authors.

The international version of the database was constructed

on the Windows of International version with Delphi 6 also of International version. The database was copied on the CD-R disks for distribution.

The development and evaluation of a National Assistive Technology online database

Authors: Trish MacKeogh and Alex Stankovic

Work has commenced on setting up a National Web-based Information Database for Assistive Technology in Ireland. The database is organised within the framework of the ISO classification of Assistive Technology and the framework of the design for all principles.

This study evaluates both designer's and the user's views on the critical areas for inclusion and validation of the web site usability. Results of a questionnaire and a task usability study are presented in the context of measuring user satisfaction with this project.

Parallel Session B

New Technologies and Innovation

Date: Monday 1st September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 2

Chairperson: Gary McDarby

Virtual Sounds and Virtual Spaces to support Persons with Cognitive and Physical Disabilities during Information Retrieval, Rehabilitation and Learning

Authors: Thimoty Barbieri and Licia Sbattella

People with physical, cognitive or relational impairments may experience great benefit from using advanced computer based technologies. The paper presents the first results of studies in using sound, vocal, and musical cues within virtual digital environments, designed to enhance the cognitive functions of participants or to provide better opportunities in rehabilitation and learning.

Three different areas of research have been pursued:

- a) the use of research and hierarchical navigation strategies, in combination with text -to-speech and voice recognition technologies, to allow Internet access via a telephone network to physically or hearing impaired subjects;
- b) the use of voice recognition and three dimensional spatial sound clues to support rehabilitation activities of cognitively impaired subjects (with mental retardation, autism or other pathologies);
- c) the use of multimedia and three-dimensional virtual environments, with spatialized sounds and music, to create musical and interactive stories with children with difficulties in verbal communication and social relationships.

An Investigation into the performance of Augmented Reality for use in the treatment of Phantom Limb Pain in Amputees

Authors: Kieran O'Neill, Annraoi dePaor, Malcolm MacLachlan and Gary McDarby

Phantom limb pain is the distressing problem experienced by many amputees, defined as a painful sensation perceived in the area of the missing body part. Phantom limb pain can be very severe and disabling. It continues to be experienced by two thirds of amputees, eight years post-amputation.

Augmented reality has the ability to change a person's sensory experience. More applications of this technology are gradually being utilised for therapeutic purposes as augmented environments can be used both to distract the attention of patients from excruciatingly painful experiences and to promote cortical re-mapping at the site from where the pain arises.

Using augmented reality, an environment has been created where upper limb amputees can both view and control motion of their phantom limb to help alleviate phantom limb pain.

State of the art technologies for accessible Internet applications: E-learning example

Authors: Matevz Pustisek, Iztok Humar and Janez Bester

The article presents modern approaches in the design of Internet applications. The main focus is set on new software architecture and technologies like multi-tier architecture, XML, XSL and CSS helping the developers building flexible Internet applications. This flexibility assures that the design-for-all principle can be applied with minimum technical limitations and thus results in single solution, which can be tailored to various requirements, including those of users with special needs. In this way following features can be provided: different graphical and non-graphical user interface layouts, personalisation, multi-modality and others.

Practical value of the technological framework presented is shown in an example of an Internet based elearning systems, encompassing both the learning management system and the learning content perspective.

Facilitating Internet Usage for People with Cognitive Limitations

Author: B. Harrysson

The ACCeL System (Assistive Computer Control easy to Learn) can be used by people who have cognitive limitations to open computer programs, open favourite web sites and send video mails. The system uses the C-pen 10 to scan text and the ViTal screen reader to read text aloud for people who have difficulties in reading and writing.

The Logitech videocam was also used to record video mails. By using a special OCR pattern called Anoto, it is possible to navigate the Internet directly from paper using the C-pen outside the computer. The user can have personal pictures as symbols of favourite web sites.

Seven students in special schools and centres in southern Sweden have used the system for two months. The students have carried out two tests to evaluate the usefulness of the system.

Aided navigation for disabled people : Route recognition with HMMs - First results

Authors: Yann Morère and Alain Pruski

In the last decade, several international researchers have developed intelligent wheelchairs for disabled people. Many of these projects have based their control structure on a sensor-referenced control. Several control types are available in this respect; however, the type selected is the user's responsibility. A former study has established a behaviour-based control -multi-agent based control-ensuring selection of the best control type in a given local environment in relation to the user's preferences.

This control aims at merging the human person with the machine to reach a kind of symbiosis, designing a machine that is more user friendly and has a more efficient control. This paper proposes a new approach based on this behaviour - based structure, aiming at assisting the user in a global way.

The intelligent system relies on a modelisation of the most frequently used routes and assists the user when navigating by suggesting the next movement when the route has been recognised. The user will not have to change the direction, thus sparing him/her an action which can be long and tiring in case of a severe disability. The paper presents the first

results of the approach adopted, providing a tentative but reliable HMM model of the route taken.

Bridging the gap: access to audio sources for people with hearing aids

Authors: Iverna van Riesen, Frank Vlaskamp and Gert Jan Gelderblom

Hearing aids provide amplification and processing of sound. For hearing disabled users this is not always satisfactory. Ideally, the distance between a speaking person and the microphone should be reduced to the minimum. Otherwise, background noise, like near traffic, an echoing environment or other people talking, will interfere with the audio source to be heard. It is obvious that the hearing aid with built-in microphone falls short in this respect.

Existing Assistive Listening Devices (ALD's), such as room loops and FM -systems bridge the gap, but fall short of sound quality and flexibility. The BlueEar project aims to improve performance of ALD's by using wireless, digital network technology. In 2003 BlueEar prototypes will be tested in field trials with potential users.

Besides addressing possibilities to bridge the gap between hearing aid and audio source, this paper will describe the BlueEar concept and the BlueEar field trials.

Parallel Session C

Assistive Technology for Support and Care

Date: Monday 1st September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 3

Chairpersons: Rachael Glennane & Harry Knops

The Human Technology Project - a pioneer project about psychiatric disabilities

Authors: Catarina Brun and Claes Tjäder

Approximately 2 per cent of all people in Sweden suffer of severe psychiatric illness. During the last years the municipalities have increased social investments within significant life spheres such as housing, daily occupation, work, recreation, rehabilitation, social fellowship, health care and social welfare schemes. Approximately 70 per cent of all people with psychiatric disabilities live in their own homes. The project Human Technology We started this project because we wanted to change the fact that people with psychiatric disabilities did not have access to assistive technology to solve the daily life problems. In the project 12 people with psychiatric disabilities receive assistive technology products for use in their homes and/or computer support in special activity centres as well as training.

Assistive Technology at the Hospital Bedside

Authors: G. Cook, J. Barrett, L. O'Neill, R. McCrindle, D. Booy and F. Arnold

Many hospital patients can feel isolated from telephone/electronic contact with their family, friends and work mates. This paper summarises the features offered by a 'hospital portal' that provides information, communication and entertainment to patients. Initially work to develop an inclusive interface for the assessment of screen features was started and some of this work is described here. Whilst

there are many aspects to consider, the influence of text size, screen and icon colours and the resultant screen contrast are important. This paper reports on the clarity and acceptability rating of 94 older people who were shown a range of text sizes, icons, colours and colour contrasts. The method of data gathering and the overall results are described.

Functional Analysis of cushions for pressure-sore prevention

Authors: Poveda Rakel, Barbera Ricard, Garrido José David, Peydro Francisca, Sanchez-Lacuesta Javier and Parra Antonio

IBV has developed the Project "Functional Analysis of cushions for pressure-sore prevention" with the aim of generating information based on technical and functional analysis to compare different kinds of cushions. Different kinds of cushions have been analysed, selected following criteria related to materials, shape, etc.

This research activity has been supported by the Instituto de Migraciones y Servicios Sociales (IMSERSO) and Centro Estatal de Autonomía Personal y Ayudas Técnicas (CEAPAT). Also the Hospital Nacional de Paraplégicos de Toledo, CAMF-Guadalajara, Grupo Nacional para el Estudio y Asesoramiento en Úlceras por presión y Heridas Crónicas (GNEAUPP) have collaborated actively in the project.

The cushions have been tested in IBV Technical Aids Laboratory and the user tests have been carried out in collaboration with CAMF-Guadalajara. The results of the project enable a better selection of cushions to be made according user necessities.

SILC - A Project to Enhance Independence

Authors: P. Mayer, G. Edelmayer and W.L. Zagler

The aim of the partly EU funded project SILC (Supporting Independently Living Citizens) is to enhance the quality of life of older and infirm people by postponing the need for institutionalisation. To achieve this, a portable wrist-worn life-signs monitor is developed. It will intelligently monitor the well being of the user and report alarms in the event of problems being detected and permit two-way conversations with care providers.

The main innovation of SILC is the inclusion of a set of biometric sensors to monitor e.g. the heart pulse rate, the body temperature, the movement of the device etc.

The paper will give a general introduction to the project and a status report on the first prototypes. Results of the user tests will be given in the oral presentation.

Effect of Increasing Stimulation Intensity during Loading Response on Heel Rocker Function during FES-corrected drop foot

Authors: Thomas O'Halloran and Gerard M Lyons

Drop foot stimulators today operate open loop with a trapezoidal stimulation profile. The traditionally applied profile originated as much from technological constraints as suitability for the physical pathology being corrected. Due to advances in implant technology, offering more accurate, selective stimulation, and new microprocessor technology, offering low powered high performance, it is considered an opportune time to examine the effect of varying the stimulation profile.

One patient using an implanted stimulator was tested with various profiles which provided increased stimulation during loading response. It has been shown that increasing stimulation intensity prior to heel strike affects the ankle trajectory in a positive way. The ankle angle trajectory during loading response becomes closer to that of normal gait.

The phase of gait known as the heel rocker is prolonged. As this is an essential element for progression and provision of shock absorption during loading response, we believe this is a positive effect.

Parallel Session D

Assistive Technology and the Environment

Date: Monday 1st September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 4

Chairperson: John Tiernan & Pier-Luigi Emiliani

The use of mobile phone equipped with handsfree and voice recognition capabilities in demanding accessibility environments

Authors: Anne Kanto-Ronkanen, Anna-Kaisa Koistinen, Jarkko Kokkonen, Raija Saarela and Olavi Toivainen

This is a case study of the feasibility of using mobile phones with accessories such as a car kit as an aid to disabled people. The objective of the study was to investigate whether the mobile phone products could be used by disabled users with little or minor modifications. The study uses a Nokia model 6310i mobile phone with a speech recognition capability. This phone model was used with a Bluetooth connectivity based Wireless Car Kit CARK-112, which has a full handsfree capability and a separate remote control button.

The study reveals that selected test equipment set could be readily used by our disabled testers. The device needed only some adjustments in the power supply and the physical installation of the phone. The results of the study were encouraging: the installation and use of the mobile phone and car kit is straightforward and convenient.

Our recommendation to the electric wheelchair manufacturers is that they should be encouraged to incorporate the mobile phone technologies in their products. Further, assistive technology professionals should not overlook the potential of the common technology.

Study on developing the new criterion of level differences for the wheelchair

Authors: Saki Kasuya, Ikuo Yoneda, Michiko Bando, Osamu Sueda, Masafumi Ide and Hidehisa Oku

Obstacles, especially small differences in floor level and ramps in housing often cause difficulties for manual wheelchair users with regard to access. The degree of difficulty is dependent on body frame, the diameter of the wheelchair's casters, and the user's ability to propel the wheelchair.

To estimate the difficulties associated with various types of level differences and ramps quantitatively, the load on the user and the ability of the user were studied. Using the data for overcoming the level differences, we attempted to determine quantitative scales for reasonable height, shape, and gradient of level differences or ramps for manual wheelchair users.

Using virtual reality in psychology (Virtual worlds in treating agoraphobia and acrophobia)

Authors: Viktória Laky and Cecilia Sik Lány

Many people suffer from various phobias. While most people can surmount them by simple self-suggestion and they may not cause too much trouble for them, for others this form of fear could significantly limit their life. The aim of our work was creating virtual environments, which could be used for this purpose. Of course we were unable to undertake the research all of the existing phobias; we created virtual worlds for treating agoraphobia (fear of wide, open spaces) and acrophobia (fear of height).

Virtual environments were created by the help of VRML and Maya. Our future plan is to create virtual environments in real video pictures and movies, and to investigate the reality ratio of virtual worlds, namely to try to find the relationship between the reality of virtual worlds and their effectiveness in therapies. Our aim is to prove that a middle realistic virtual environment could be as effective as an absolutely realistic one.

Producing virtual worlds for the rehabilitation of disabled people (Simulating shopping for autistic children)

Authors: Cecilia Sik Lányi and Ádám Tilinger

Autism is a severe disorder of brain-functions that negatively influences social behaviour, communication, the imagination and the elastic thinking of the person. The Hungarian pedagogic decree (23/1997. (VI.4.) MKM) discusses the principles of the school work of autistic students in three chapters.

The third chapter discusses those questions that have to be considered so that the child should be able to adapt itself into grown-up life to become independent and should be able to do some work. At the University of Veszprém we have developed a package of computer programs that can be used in this phase of the rehabilitation work, and can help both the work in the school, but can also be applied at home.

Besides developing a program that teaches the child in a playful form we have investigated the following questions; can virtual reality be used to teach autistic children; what are the barriers of it's application; are the best methods to move in virtual reality for an autistic child.

Adaptation of the Computer Workplace for the Quadriplegic Person

Authors: Dusan Simsik, Alena Galajdova

The paper describes adaptation of the computer workplace for a quadriplegic person. The whole process is described - from identifying the individual's needs to training, human/machine interaction development and final implementation and training. The person did preliminary training with Headmaster and JOUSE units controlled by the head.

Preliminary training in software included Wivik and standard tools for windows accessibility. User declares satisfaction and good experience even in work with technical drawings.

Parallel Session E

Assistive Technology for Sensory - Visual #2

Date: Monday 1st September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 5

Chairpersons: Klaus Miesenberger and Stuart Lawler

Libbraille: a Portable Library to Easily Access Braille Displays

Authors: Sébastien Sablé and Dominique Archambault

The TiM project intends to develop and to adapt computer games for visually impaired children. In order to achieve this project a library which allows easy access to Braille displays was developed.

This library provides all the functions needed to write text on the Braille display, directly raise Braille dots as well as receive the keys pressed on it. On top of that this library works with many different types of displays and is freely reusable.

Improving Blind People's Spatial Ability by Bimodal-perception Assistive Device for Accessing Graphic Information

Authors: N. Sribunruangrit, C. Marque, C. Lenay and O. Gapenne

The Braille Box is an assistive device developed for helping blind people access graphic information by tactile perception. We use the Braille Box to explore and recognize geometric forms on a computer screen. The main problem which limits the recognition performance is that when exploring geometric forms in space, blind people need reference points or axis to let them access spatial information. Therefore, we use reference points indicated with a sound, together with the Braille Box.

The result from this experiment shows that we can increase the performance of exploration and recognition of

geometric forms with this bimodal perception. We therefore plan to apply these reference points to help blind people to improve their spatial memories and spatial perception abilities when using devices based on tactile stimulation.

Helene : A collaborative server to create and securely deliver documents for the blind

Authors: Guillaume du Bourguet, Benoît Guillon and Dominique Burger

The access to written information is essential for the inclusion of individuals in modern societies. At school, at work it is an important success factor. At home it is a source of pleasure and cultural development. In this paper we describe a service that has been developed to improve the cooperation between the different actors involved in producing and distributing books in alternate formats for visually impaired persons.

The Helene Server 2.0 provides a complete framework to manage books information, publishers relationships (authorization and retribution) and to track editing and delivering workflow. All exchanges from Helene are highly secured to protect publishers from unfair use. We also provide a set of tools to bring plain text files to a more structured DAISY 3.0 format ready for Braille printing.

Providing blind people with access to technical diagrams

Authors: Paul Blenkhorn, Gareth Evans, Alasdair King, David Crombie, Sijo Dijkstra, Bláithín Gallagher, Mark Magennis, John Wood, Cornelius Hagen, Christoph Schlieder, ko Horstmann, George Ioannidis, Anne-Marie O'Neill and Helen Petrie

This paper describes the operation and evaluation of a series of prototype systems that have been developed (as part of the EU-funded TEDUB project) to give blind people access to diagrams in well-defined technical domains: software engineering diagrams (UML), architectural plans and electronic diagrams.

The prototype systems focus on how information (including logical structure and spatial relationships) can be conveyed to a blind user through the use of structured hierarchies

and a variety of input and output modalities (including sound (2D and 3D) and force-feedback joysticks).

The paper describes the context of the TeDUB project, the architecture of the prototype tools and the final system, and gives detailed evaluation results based on trials with over 20 users. The evaluation results show that connectivity and relative position can be effectively conveyed, but that the relationship between logical and spatial structure needs further development.

Study on Acoustical Training System of Obstacle Perception for the Blind.

Authors: Yoshikazu Seki and Kiyohide Ito

Obstacle perception is a skill to detect presence of "silent" object, such as a wall, pole, etc., by perceiving the acoustical cues, such as reflected sound, etc., through auditory sense. This skill is very important for orientation and mobility (O&M) of the blind. We are studying the training system for acquiring this skill in blind education and rehabilitation by using acoustical technologies. Our training system consists of sound processors for making reflected sounds and several loudspeakers, and can reproduce ideal sound fields for learning the principle of obstacle perception.

We are also distributing the audio CD that contains these sound fields to the people concerned with the blind education and rehabilitation. Our system is now used in the school for O&M instructor in Japan, and our CDs have been distributed to about 40 Japanese facilities concerned with the blind. We intend to distribute these abroad. Detail of this CD is described in the web site: <http://staff.aist.go.jp/yoshikazu-seki/CD/CD10/>

The Accessibility of Interactive Digital Television

Authors: John Gill and Sylvie Perera

Interactive digital television [iTV] is a potential revolution in home infotainment which, if accessible, can improve the access to information for people with disabilities. Unfortunately a digital divide has arisen between those who have access to digital technology and those that do not - the latter are mainly elderly people. As people age they can suffer from decreasing sensory, mental and physical abilities e.g. increasing visual impairment.

Applying inclusive design by adopting a user-centred approach to iTV could make it accessible and bridge this gap. Smart cards provide a viable means of configuring the system to the user's specification. What do people want and require? How should these features be designed? Where do the parameters lie?

This paper describes research to identify user needs for access to iTV and discusses methods for implementing inclusive design in this area.

Parallel Session A

Assistive Technology for Mobility - Control Systems

Date: Monday 1st September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 1

Chairpersons: Liam Bracken and Leonor Moniz Pereira

Usage log analysis to support prescription of a switch-activated wheelchair controller

Authors: Peter O'Neill, Mark Hawley and Chris Roast

The evaluation of the suitability of Electronic Assistive Technology (EAT) devices is often subjective and limited in scope, or time consuming and invasive of the client's privacy (e.g., requiring long field observations). Here we discuss an alternative method of evaluating suitability, by studying the usage of the EAT through the collection of data logs, which minimises the need for field observation.

The analytical techniques discussed provide direct feed back to the clinician on possible enhancements to the configuration of the device, which should improve the use of the system and consequently enhance quality of life. It is proposed that the methods, in the long term, should be included within EAT devices and, as a result, the individual could make informed modifications to their interface configuration, hence empowering them and reducing the reliance for third party intervention.

A Head Controlled Powered Wheelchairs using Gyro-Sensors.

Authors: Takeshi Someya, Tatsuya Sano and Minoru Kamata

This paper outlines a Head Controlled Powered Wheelchair using Gyro-Sensors, which can be operated by a person who has been suffering from cerebral paralysis and may well require help in nearly all activities of daily life. In our study, the user was unable to move either his arms or right leg. He could slightly move his left foot as well as his neck, from

right to left, and these were thought to be the only actions that might enable him to control a real wheelchair by himself.

However, the involuntary movement prevented him from successful handling of the chair, especially when tired or when particularly nervous. The wheelchair uses an algorithm to distinguish the person's voluntary movement from his involuntary movement. This has brought a really safe and stable drive for the heavily disabled.

Quantitative evaluation and analysis of influences of floor conditions and position of rear wheels on maneuvering the manual wheelchair

Authors: Ikuo Yoneda, Saki Kasuya, Michiko Bando, Osamu Sueda, Masafumi Ide, Hidehisa Oku and Minoru Kamata

We constructed a specially designed manual wheelchair equipped with torque meters on the hand-rims and rotary encoders in the axles of the rear wheels. Using the wheelchair, we investigated the influences of floor surface conditions and position of the rear wheels on maneuvering it.

The result shows that the faster the wheelchair runs, the less momentum per 1 meter travelling when running on soft surface floor, and that shifting the position of rear wheels forward might make the running performance of wheelchair slightly efficient. And, it became clear that the centre of gravity of wheelchair-rider would be shifted backward at push phase. That might have an effect on improving running performance of the wheelchair.

Development of Marina, an Amphibious Wheelchair, to allow disabled people to access the beaches and bathe

Authors: Barbera Ricard, Baydal José María, Belda Juan Manuel, Comin Mario, Poveda Rakel, Prat Jaime and Corell Alejandro

The Institute of Biomechanics of Valencia (IBV) has developed an amphibious wheelchair specially designed to improve the complicated access of disabled people to the beaches and to bathe. This wheelchair rolls softly on sandy surfaces, allows an autonomous transfer from the user's wheelchair and floats letting the user enjoy the water. By

including the users and carers from the beginning it has enabled us to establish the basis on which to define the characteristics of the amphibious wheelchair. Quality Function Deployment (QFD) methodology has been applied to obtain the design requirements of the amphibious chair.

The advantage of applying this methodology is the inclusion of all the agents involved in the product in a systematic and organized way. The project has been promoted by Conselleria de Benestar Social (Welfare Department) of the Valencian Government and financed by IBERDROLA, with the participation of VIRMEDIC, S.L. as a final manufacturer.

Use of accelerometry for the long-term mobility monitoring of the elderly

Authors: K. Culhane, G.M. Lyons, D. Hilton and D. Lyons

This paper describes the evaluation of long-term mobility assessment in a clinical environment using accelerometers. The monitoring system used custom-designed, analysis software to detect activities of daily living, namely duration of sitting, standing, lying and moving over the period monitored. An investigator shadowed the subjects during the recording period, which enabled an assessment of the system detection accuracy to be carried out. Five elderly subjects were monitored over four days.

The monitoring device consisted of two Analog Devices ADXL202 accelerometers and an ambulatory data-logger. A MATLAB® program allowed trunk and thigh threshold angles to be set to distinguish between sitting, standing, lying and moving. Threshold detection using a best estimate value was adopted, and an average detection accuracy for sitting and lying of 93% was obtained.

The authors conclude that mobility monitoring using accelerometry is a practical mobility monitoring technique suitable for application in a clinical setting.

Parallel Session B

Service Delivery - Process

Date: Monday 1st September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 2

Chairpersons: Marcia Scherer and Lisa McCormack

Individual Process : a tool for Inclusion

Author: Christian Bérard

One of our research objectives with regard to system building is to take into account all the distinctive features of men and women in order to show that whatever disabilities they may present with do not represent constraints preventing them from taking a valuable part in the system.

The concept of Individual Process is used to model the true needs of men and women confronted with the various processes of a system. In this analysis, we first clarify the various statuses of man, secondly, regardless of whether he or she is disabled or not, we discuss autonomy as a major factor mainly related to his/her ability to establish relationships: with oneself, with others and with the environment.

The main elements making up an Individual Process are then presented and finally, we sum up how the Individual Process is used as a tool for inclusion.

Delivery system of Assistive Devices: Guidelines and Protocols

Authors: H.T.P. Knops and E. Reichrath

The changing policy around the delivery of assistive devices in the Netherlands towards a demand-controlled approach, makes transparency and efficiency essential for all parties involved, i.e. clients, healthcare professionals (diagnosing and advising) and insurance companies. Instruments to accomplish this are guidelines and protocols.

Results from an inventory in the Netherlands show that

suitable guidelines and protocols do not always exist. If there are (national) guidelines, implementation into the regional situation is not happening a lot. Besides this, insurers mainly use legislation only to approve for the supply of a device.

The quality, topicality, implementation and evaluation of existing and future guidelines and protocols has to increase. In this case they will be used more and transparency and efficiency of the delivery system will improve. The critical question is if guidelines and protocols, indeed, will lead to more transparency and efficiency in the delivery system.

Client assessment for assistive technology: the SIVA model

Authors: Renzo Andrich and Ingela Johnson

Fondazione Don Carlo Gnocchi Onlus, a major provider of rehabilitation services in Italy, is currently committed in establishing Client Assessment Centres for Asseritive Technology in most of its rehabilitation and call centres. Their mission is assisting the clients and the professionals caring for them in identifying and select appropriate asseritive solutions to their need.

Nine such centres are now in operation in 8 regions of Italy, based on the previous 20-year experience of the SIVA centre in Milan. A quality control system was established by means of a certification process that involved definitions of work methods, standard of practice, instruments and operational procedures. The paper provides details of the model and discusses how this works in practice.

The paper also describes the major information tool supporting the assesement activity, i.e. the Italian Portal on Asseritive Technology launched in May 2003 with the support of the Italian Ministry of Defence.

A General Structure for Assessment Studies of Assistive Technology

Authors:

Inger Hagen, Torhild Holthe, Petrina Duff, Suzanne Cahill, Kerry Jones, Päivi Topo and Sidsel Bjorneby

The aim of this study was to develop a methodology, i.e. a system of methods, for assessment of technical assistive aids for people with dementia.

A general structure in 6 steps is developed:

- 1) Selection of analytical framework;
- 2) Selection of study design;
- 3) Identification of relevant aspects;
- 4) State of the art reviews of the relevant aspects;
- 5) Selection of methods;
- 6) Development of the assessment protocol.

The appropriateness of the general structure has been tested in practice through development of a protocol for an assessment trial of assitive aids for people with dementia living in their own home. Ethical approval was obtained in the participating countries; Ireland, England, Norway, Finland and Lithuania.

Seven devices, five of which have been developed as part of ENABLE are presently being assessed, and experience so far indicates that the protocol works well. This work is part of the ENABLE project [1].

[1] Funded by the European Commission under the programme 'Quality of Life and Management of Living Resources', Contract No. QLK6 - CT 2000 - 00653

Improving Assistive Technology Services - ITSE Project

Authors: A-L. Salminen and P-L. Kotiranta

This paper will introduce a national project for improving assistive technology services and present the methods and some preliminary results of the project evaluation. The ITSE-project aims to improve knowledge and promote assistive technology expertise of the staff who work in the welfare and health care services; develop new models and networks for the welfare and health care services; disseminate knowledge of new technical developments and services to the staff and users in relation to new assistive technology.

The project is implemented as eighteen local projects and it covers 350 municipalities. The objective and stakeholder oriented project evaluation consists of three methods; the know-how questionnaire, the objective oriented progress evaluation and interviews. Preliminary results of the evaluation show that the project is needed.

Active involvement of local stakeholders, and both local and national networking have proved to be important for facilitating learning and change in assistive technology services.

Statement of need (SON) in an Assistive Technology Service Delivery System - Implications for Policy and Practice in an Irish context.

Author: Gerald Craddock

The Statement of Need (SON) has been available to students with disabilities in many countries for the past two decades. It is now set to be introduced through new legislation in Ireland. For Irish policy makers and practitioners there is a good deal to learn from international practice and critiques of SON. A national pilot project, STATEMENT has monitored forty-five students with disabilities progressing to post-secondary education provided with a statement of need.

STATEMENT encompassed a social model approach within a systems framework based on a partnership philosophy using the Matching Person and Technology (MPT) instruments to deliver a quality service to students with disabilities.

Parallel Session C

AAC - Hardware and Software

Date: Monday 1st September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 3

Chairpersons: Joanne Dowling and Isobel Connolly

An User-Centered Approach for designing CLAPOTI: an assistive technology designed for speech and motor disorders

Authors: Frédéric Vella, Nadine Vigouroux and Philippe Truillet

Communication disorders severely influence the quality of the life. Whereas AAC typing systems improve the communication rate for disorders, persons with speech or multiple disabilities are still too much disadvantaged. CLAPOTI, a voice communication assistive technology aims at offering a communication support system allowing better communication, adaptable to users and strongly varying in needs.

To reach these objectives we are developing an User-Centered design approach involving users. This approach allows a better knowledge and understanding of the users' needs for the prototype design in respect of the principles of the design for all.

We will describe the methods and the principle of each phase of the design. CLAPOTI allows voice communication by typing a phonetic input string through different input technologies (standard and on-screen keyboards). Some subjective evaluation results are commented.

Temporal analysis of the use of an augmentative communication device

Authors: Guy Bourhis and Pierre Pino

The objective of this paper is to develop a method asking it possible to optimize communication scanning aid. For that purpose, the procedure is based on the analysis of the data

recorded in log files obtained when applying the EDITH (French acronym for Digital Teleaction Environment for the Persons with disabilities).

This analyse is based on and customize the temporal parameters of the human-machine interface of a the MHP model [8]. Some results are commented to conclude this paper.

Video extracts of effective social conversation using a whole-utterance VOCA

Authors: John Todman, Portia File and Jeff Higginbotham

TALK is a computer-based voice output communication aid (VOCA) for people who are literate but unable to speak. It is a whole-utterance storage and retrieval system that models pragmatic aspects of natural conversation to support realistic social conversation. It supports conversational rates about 4 times faster than is generally possible with systems that rely on utterances generated as they are needed during a conversation.

Rate enhancement is achieved without sacrifice of conversational quality. It contributes to enjoyment of the aided conversations and results in more positive attributions of social competence. Extracts from video recordings of free-ranging aided conversations will be used to illustrate features of the system and its effectiveness in supporting social conversation.

Reference will be made to current research aimed at the development of a new system (Contact) that combines aspects of TALK that support social chat with aspects of FrameTalker, a complementary system that supports transactional conversation.

CONTACT: a communication aid based on pre-prepared phrases

Authors:

Portia File, John Todman, Jeff Higginbotham, Gregory W. Leshner and Bryan J. Moulton and Norman Alm

Conversational rate is critical for satisfactory aided conversation. TALK, which is based on pre-prepared, user-generated phrases, can support enjoyable social conversations at conversational rates that are 3-4 times faster than alternative systems.

Contact is a new communication aid that combines TALK with Frametalker, a system for transactional conversation that is also based on pre-prepared phrases. Contact features will be described. These include:

- 1) user-generated pre-prepared phrases for social communication,
- 2) pre-prepared phrases largely generated from ethnographic studies for transactional communication,
- 3) pre-prepared generic comments that are useful in a wide range of situations,
- 4) a keyboard for adding new phrases during a conversation when no appropriate pre-prepared phrase is available,
- 5) an editing system for adding and modifying the available pre-prepared phrases.

Contact is currently being evaluated to determine how well it can support the social and transactional conversations required for successful participation in office settings.

Communication for the Non-Speaking Deaf Using An Embedded Prediction System

Authors: Anthony McCloskey, Prof. Martin McGinnity, Dr. Liam Maguire

This paper proposes a system that facilitates electronic communication in the deaf community using sign language. Conventional communication methods such as text messaging or writing do not possess the power of expression, the naturalness or the convenience of sign language. As a result previous research using image processing and wearable devices have offered limited success for automated sign language systems.

This paper reports an alternative approach based on a written form of sign language, Sign Writing. The proposed system incorporates a database of signs and an entry system to create new signs. A prediction system is required to assist in the selection of signs from the database to enable the user to maintain conversational speed between two hand-held devices. Such prediction employs knowledge of sign language, the environment and the user's historical conversations to aid the utterance composition.

This paper provides a comprehensive overview of the system, describing initial results and demonstrating how the proposed system can also be employed as a translation system between different sign and conventional languages.

Parallel Session D

Design for All - User Centered Approaches

Date: Monday 1st September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 4

Chairpersons: Christian Buhler and Gerry Ellis

In the drivers seat: how developments in open-source/free software put users in change of their destiny

Author: Bill Haneman

One of the frustrations expressed by end-users and assistive technology developers alike is a feeling of dependency; users are dependent on AT and OS vendors for updates and bug fixes, and AT developers are in turn dependent on OS and application vendors for bug fixes, support, and even proprietary information. In spite of recent accessibility regulations, important user improvements may wait months or years for deployment; with little opportunity for direct contribution by users or advocacy groups.

The free software movement and the development of an entire free-and-open- source accessible desktop changes the rules for assistive technology developers and users alike. Not only is the source code for desktop and applications openly available for examination, accessibility fixes and enhancements may freely be reincorporated.

Thus it is feasible for user groups, individuals, and advocacy groups to bundle and redistribute accessibility solutions ranging from scripts to complete "turnkey" software systems. We will describe where to get a complete open-source accessible desktop, and will also discuss implications for the future of assistive technology.

Design for Cognitive Assistance

Author: Arne Svensk

Distributed cognition as a design model increases the scope of design for cognitive assistance and thereby the opportunities for finding solutions that correspond to a person's needs, wishes and dreams. This paper summarizes the results from a number of design processes involving people with cognitive limitations. These processes have much in common with general design but also have their own distinctive features.

For an artefact or phenomenon to be accessible to a person with reduced cognitive abilities, it should support the person's awareness of Security, context, Experience/memory and Precision (STEP). The paper also emphasizes the key role that personal assistants play in the design process and discusses how their knowledge and commitment can be put to use.

Bottlenecks and Their Solutions for Development of Assistive Technologies.

Authors: Takenobu Inoue, Atsushi Tsukada, Takanori Aikawa, Hideyuki Hirose, Toru Tamura, Kazuyuki Itoh, Koichi Yokota, Misato Nihei and Hiorki Ishihama

This paper describes the process of assistive technology (AT) development and a comprehensive approach to develop practical ATs. Development processes of ten ATs were investigated, then, bottlenecks and their solutions were pointed out.

Results of them revealed that developers were frustrated with large barriers between developed devices and commercialized devices. Discussion among AT developers resulted in indication of two paradigms for their solutions. One is a good development process that includes solutions of each bottleneck in advance.

Another paradigm is considering the relationship between the AT's and society. It includes outcome research of the AT's, consideration of the social system and thoughts of users and stakeholders. AT development research should consist of these two paradigms and will advance towards creating useful ATs for the users.

Towards improved user participation

Authors: Lina Gauffin and Margita Lundman

This presentation reports a few results from a survey on the experience of user participation in ICT research. The survey has been carried out within the framework of a new three-year Swedish project on user involvement in the ICT field.

The survey has been carried out with the aim of collecting information on attitudes and experience among Swedish researchers towards involving people with disabilities in technology research. More than 100 researchers have provided comments on their views and experience.

Study Programme in User-Centred Design

Authors: Juha Hautanen, Tiina Kuukkanen, Jorma Matilainen, Matti Siistonen and Jyväskylä Polytechnic

The design of assistive devices involves professionals from several branches who, however, may not be used to working together in a group. In such a case, the design process should guide the work of the group. The changes in educational systems have made it possible to build up a new postgraduate education programme focusing on improving the design processes of assistive devices. The main frame of this programme complies with the ISO 13407 standard Human centred design process for interactive systems.

The students must have at least a BSc level degree and three years of work experience. Each student has a personal study programme based on the objectives to develop the students' competences and to improve their career prospects. The professional development project, solving a working-life design problem, forms a central part of the education. All the individual modules should be connected with the project.

Parallel Session E

Assistive Technology and Older Persons

Date: Monday 1st September 2003
Time: 13:30 - 15:00
Venue: Veterinary Building - Room 5
Chairperson: Andrew Semple

Development of a Cooker Monitor for People with Dementia

Authors: C Gibbs, T Adlam, R Faulkner and R Orpwood

Some people with dementia who wish to live independently may pose a risk to themselves and others from occasional absent-minded use of the kitchen cooker. The authors have developed a system for monitoring the use of a cooker so that the risk of an adverse incident occurring can be reduced.

The system is designed to support the user by intervening should a potentially dangerous situation arise. It utilises sensing elements to monitor the cooker and its environment, and electromechanical replacement knobs that can turn off the hob. Following an intervention by the system, the cooker can be used as normal. Should the apparent danger persist, a safety valve will shut off the cooker supply, and a carer will be alerted via text message. The system is currently undergoing long-term evaluations in the UK and Ireland.

Multimedia use by people with dementia

Authors: Outi Maki, Päivi Topo, Kristiina Saarikalle, Emer Begley, Nick Clarke, Torhild Holthe and Kerry Jones

Despite several losses people with dementia maintain many abilities, but it is a challenge to find activities in which these can use their abilities and get positive feedback. Multimedia stimulates several senses and in previous studies music in different forms has been found to support wellbeing of people with dementia. In our study we used a multimedia programs similar to Karaoke. In the design of the programs dementia specific user requirements were taken into

account.

The programs are created by Do-it-yourself-Picture Gramophone Program in Finland, Ireland, England and Norway. They include favourite songs of the users. The main focus in follow up is on the use of multimedia programs, attitudes towards the programs and impact of the use.

In our presentation we will summarise our literature review on use music in dementia care, describe the multimedia programs developed and explain the assessment protocol. We will also show our first findings on the implementation of multimedia in dementia day care centres. The study is part of European Union funded ENABLE project.

Psychosocial Impact of Assertive Technology Devices in Stroke

Authors: Jeffrey Jutai, Robert Teasell, Mark Hartley and Mark Bayley

Despite the prevalence of assistive device use following stroke, the patterns of device adoption and the psychosocial impact of devices used by stroke survivors are not well documented. This paper presents preliminary findings from a study of 450 individuals who had a first-ever stroke, and are part of a Canadian inception cohort study of quality of life following stroke.

We found that canes, walkers and wheelchairs were the most frequently adopted devices following stroke. Using the Psychosocial Impact of Assistive Devices Scale (PIADS), stroke survivors reported that their devices made a positive impact on psychological well-being and subjective quality of life. PIADS scores varied as a function of the category of assistive device and the side of the brain lesion.

Fall detection in the elderly using Accelerometry

Authors: Alan Bourke, Gerard M. Lyons, Karen Culhane and Jacinta V. O'Brien

Developing a reliable, remote system to detect when an elderly person has fallen would improve the security of elderly people living alone. The development of an algorithm to detect a fall event using accelerometry is described. Using simulated falls under supervised conditions onto crash mats, the detection of falls is accomplished using

accelerometer-based sensors, mounted on the trunk and thigh of the person.

Data analysis was performed using MATLABi to determine the peak acceleration recorded during four different types of falls, namely forward falls, forward two-stage falls, backward falls and backward two-stage falls. Results show a fall event can be detected using thresholding techniques.

Parallel Session A

Service Delivery - Innovations in Practice

Date: Monday 1st September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 1

Chairpersons: Jan Engelen and Maura O'Leary

Towards a more comprehensive AT Service for people with neurological disabilities in Ireland

Authors: Bob Martin and Ciara Fitzsimons

Assistive Technology has emerged as one of the central interventions in improving the quality of life of people with progressive neurological disabilities. The limitations in current service provision points to a lack of information available to people diagnosed with such disabilities.

The Central Remedial Clinic have engaged in a process over the past number of months, aimed at identifying current limitations in the service delivery process, and outlining recommendations with regards to improving the quality of services currently provided to this client group.

Towards a Repository of Individual Assistive Technology Plans.

Authors: John Gilligan, Prof. Peter Smith,

In order to meet the particular requirements of an individual with disability, it is necessary to tailor an individual assistive technology plan specifically for that individual. The development of such a plan is a complex task. One of the most significant elements of successful individual assistive technology plan development is the experience delivery personnel can bring to the project. For this reason the argument for a repository of prior IATPs is strong. If a solution already exists, then there is no need to expend the effort required to develop it from first principles. A key issue in the development of this repository is how prior IATPs can be represented. The following is an analysis of the

requirements of this representation.

Development of Japan Assistive Technology Use Monitoring System in Activity and Participation

Authors: Jiro Yonezaki, Hiroyuki Seki, Osamu Sueda, Masafumi Ide

The j-ATms, "Japan Assistive Technology Use Monitoring System in Activity & Participation", was developed to measure the effect of use of assistive technology and services, AT&S, quantitatively. While persons with amyotrophic lateral sclerosis (ALS), use many AT&S, the outcomes for AT&Ss in total daily living have not been clarified yet.

In this research, two time serial data, the degree of needs-achievement and the degree of satisfaction in use of AT&S, were collected from ten persons with ALS by j-ATms, and the factor analysis of the data showed the validity of j-ATms and extracted the effective AT&S for persons with ALS on their life style and their grade of disease.

Who are the Professionals that support Visual Impaired Persons in Portugal?

Authors: Cristina Espadinha and Leonor Moniz Pereira

This document includes the characterization of the professionals who support the visual impaired population in Portugal. The focus was the analysis constraints of professional training and working experience. Additionally, suggestions of the main technological solution and ways to maximise the human resources of the supporting teams were presented.

Service for the Evaluation and Provision of Computer and Domotic Aids for the Victims of Occupational Accidents

Authors: Mr. A. Davalli, Mr. R. Sacchetti and Mr. A. Pacetti

Following an occupational accident, INAIL (Italian Workers' Compensation Authority) provides the trauma victim with a series of services aimed at social and occupational

reintegration. In order to achieve this reintegration, a personalised rehabilitation program is created including the allocation of computer and/or domotic aids.

The programme is conducted by multidisciplinary teams of experts (located in the main Italian cities) following a precise model aimed at assessing the victim's physical and psychological conditions for his/her social and occupational reintegration, or, more simply, aimed at giving him/her greater independence. Within this framework INAIL has developed basic and advanced level distance learning courses, which also include the acquisition of ECDL certification.

In the most difficult cases the evaluation process takes place at the INAIL Centro Protesi, which has a 'smart automatic apartment' and a collection of hardware and software products for computer access.

Parallel Session B

Assistive Technology for Mobility - Assessment and Evaluation

Date: Monday 1st September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 2

Chairpersons: Simon Hall and Rob Rolleston

A survey of the wheelchair and seating market in Ireland

Authors: John Tiernan, Conor Leonard, Michael Gilchrist, and Annraoi de Paor

A survey of the provision of wheelchairs with supportive seating was recently undertaken in Ireland. The findings of this survey indicate that over half of all those currently in a range of healthcare institutions require the use of a wheelchair.

Evidence is offered that up to 84% of these wheelchair users have special handling and positioning needs that are not catered for by standard, self-propelled wheelchairs. A large market exists therefore, for products that can address these special needs.

Recommendations are made for improved design of future mobility products, and closer collaboration between manufacturers and healthcare professionals at the product design stage.

Simulation System for Powered Wheelchairs: Evaluation of Driving Skills Using Virtual Reality

Authors: H. Niniss and A. Nadif

This paper presents a simulation system for powered wheelchairs. The aim of such a system is to help to solve the problem of finding a wheelchair that could fit at best the locomotive disability of any given person. This task is usually accomplished in the real world by medical staff, and it is divided in two phases. Establish a profile of an ideal

wheelchair configuration that can be suitable for the patient's requirements (indoor/outdoor, dimensions, weight, power...). Test the matching of human-machine: the wheelchair's manoeuvrability and patient's ability to drive. In this paper the second phase of the task is taken into account. It proposes a protocol and tools to help the medical staff accomplish the task in a virtual environment. Following the description of the simulation system, the issue of the choice of the criteria is addressed, and the first results of the assessment are presented.

Extending the driving ability tester functionality

Authors: Iztok Humar, Matevz Pustisek, Janez Bester, Crt Marincek

Evaluation of the ability of patients with different diagnosis to return to driving is an important task for rehabilitation specialists. This decision making process is usually supported by measurement equipment, used for evaluation of parameters defining physical abilities and reaction time of patients. At the Institute for rehabilitation of the Republic Slovenia, Fiat Mediatester simulator for driver performance measuring is used.

The program originally shipped with simulator treats each patient as an individual and offers no possibility to compare his/her results with admissible or average result of patients with the same diagnosis. The software to improve the disadvantage mentioned above was developed and is described and commented in this article.

The software is flexible and can be used to calculate statistics over several groups of patients, measured by different simulators in different places, exchanging their data using internet. It also allows users to explore the results in different ways. New approach for numerical evaluation of previously only graphically given parameters based on curve fitting algorithm was introduced to help specialist with their decisions and is also presented.

A Framework for Adapting Wheelchair Training in Virtual Reality

Authors: Ifedayo A. Adelola, Sara L. Cox and Abdur Rahman

A child develops when it independently explores,

manoeuvres and interacts with the environment. Spatial perception and cognitive abilities develop through independent mobility at an early age. Such childhood development is hampered in disabled children with mobility impairment. Consequently, the aim is to develop an adaptable virtual reality system to provide a personalised training scheme.

Disabled children will learn more if the virtual environments can be dynamically modified to recognise their wheelchair control strengths and weaknesses. The present focus is to develop a framework for modelling the response of the wheelchair trainee to the various tasks presented in the virtual environment. This is necessary in view of the ever-widening understanding of the nature of disability.

VAHM-3 Symbiotic Architecture : First Results

Authors: A. Pruski, M. Ennaji and Y. Morere

The aim of this article is to give some results obtained by the application of a symbiotic architecture to an intelligent wheelchair, VAHM, in its third version. This architecture aims to realize a strong interaction between the user and the wheelchair. Every entity, the man or the machine, brings to the other its contribution, allowing the couple to achieve a purpose with a minimum effort for the person while conserving him the mastery of actions.

Proposal of floor design indicator based on the quantitative evaluation on driving the manual wheelchair

Authors: Michiko Bando, Ikuo Yoneda, Saki Kasuya, Osamu Sueda, Masafumi Ide

In order to make a guideline of housing and building design which considered the wheelchair users, it is also necessary to take into consideration wheelchair user's dynamic components other than spatial components.

This study critically investigates whether the mentioned standards in the existing guideline are satisfying all the needs of wheelchair users. We used the methods of quantitative evaluation of driving a manual wheelchair and collected the dynamic data under the different conditions of flooring materials, ramps and levels.

The rate of a physical load and capacity on driving a manual wheelchair drawn from this research can be utilizable as a new index of floor design.

Parallel Session C

Smart Homes #1

Date: Monday 1st September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 3

Chairpersons: Dusan Simsik and Bob Allen

Integration of wireless communication in smart homes for people with disabilities

Authors: M.A. Feki, M. Mokhtari and B. Abdulrazak

The design of a smart home dedicated to people with disabilities and elderly people must take into account emerging technologies that may respond to people with disabilities requirements and needs in term of mobility in their homes. Smart homes concept allow people not only to control some features that were previously unable to control due to their handicap, but also facilitates integrates some functionality's outside homes in public environments like the hospital, airport, cinema etc.

These new technologies allow to design a new concept defined as smart environment technologies. This paper described the integration of emerging Wireless Communication (WC) in smart technological environments and their benefit to assistive technology (AT) for people with disabilities.

Network Technologies (NT) allows a to become fully connected, controlled externally as well as internally. There are several number of heterogeneous technologies available dedicated to people with disabilities and elderly people which implies a large number of communication protocols according to each system. We could classify these networks protocols in three main types: Power Lines Communication (PLC), Bus line, and Wireless Communication. In this paper we will focus on wireless communications technologies and their role to make assistive technological aids more accessible and more portable.

This paper will cover the following points (Smart homes for people with disabilities: 1-Smart Homes can be used for older people and those with disabilities, providing safe and secure environments. 2-Networking technologies: Home networks and smart Environment can assist in undertaking

operational tasks, telecare, enables a person to remotely assessed and monitored by medical staff. Moreover, the application of this technology extends into a number of areas which are enhanced by home networks. 3-Wireless Communications technologies: Wireless communication technology improves both mobility and communication, which are two common limitations amongst people with disabilities. We will focus mainly on both radio wireless communication with Bluetooth and infra red protocol iRda.

Adaptive Smart Home System for Disabled

Authors: Vidas Lauruska and Paulius Serafinavicius

This paper describes the developing system for disabled users with physical and speech impairment. It would allow the disabled to work with the personal computer, touse today's means of communication (e-mail, SMS) and, especially, to take a full control of home environment (lighting, blinds, door, windows, heating, ventilation, air conditioning, security system, etc.)

The aim of the project is to develop a modular communication and control system which would be controllable using single input device any on-off switch and capability to adapt the system according to user's need.

The HMPH Project: Software for the Design of an Adapted Living Area

Authors: Jérôme Leloup, Pierre Gaucher, Jennifer Garcia and Julie Siffert

The aim of the HMPH project is to specify the functionalities of a movable, connected and adapted living area, enabling a better autonomy by means of appropriate assistive technologies, home automation and electronic devices. Moreover the living area should be movable, from a strongly medicalized facility to a familial area for instance.

The specifications, that will be the foundations of the adapted living area, will be established according to the disabilities, needs and wills of the resident. They will lead to the definition of the living interior layout by taking the constraints linked to them into account. To design the interior layout in a minimal time, we propose a software that will allow to make the whole layout taking the several specifications into account and to virtually visit the living

area.

The first results of the software and its prospects of evolution can be seen at <http://www.e3i.univ-tours.fr/CNHL>.

Smart Home Technology - Smart for Whom?

Author: Toril Laberg

Smart home technology has proved to contribute to increased independence and safety. During 2001 a nationwide survey was conducted to collate experience on smart home technology in Norway. The new technology was found merely in newly built residential flats. These flats are built with the support of governmental grants, aiming at old residents in need of care.

The findings inspired us to further investigate the implications of installing smart home technology in existing houses and flats. The target group are young disabled persons. In general, this group is not attracted by the thought of moving to a residential flat when their need of assistance increases.

We designed a new project in which the aims are to investigate the advantages of modern technology versus ordinary environmental control systems. The paper will discuss the findings from the new project, seen in the light of the nationwide survey.

Parallel Session D

Education and Training

Date: Monday 1st September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 4

Chairpersons: Bairbre Fleming and Dominique Archambault

Curriculum Development for Nursing and Assistive Technology

Authors: Deirdre Corby and Peter Boland

This paper addresses the issue of curriculum innovation and development for nursing education and the inclusion of assistive technology as a subject for student nurses.

The paper examines the nurses' role as part of the interdisciplinary team in creating awareness and ensuring that people with disabilities are the focus of the assistive technology process. Nurses have the greatest contact with users of healthcare services, and are therefore in a key position to ensure that assistive technology contributes to addressing their needs.

Curriculum development is the point of growth for all educational activities and a curriculum is the offering of socially valued knowledge, attitude or skill, made available to students during formal education. Contemporary nurse education needs to be relevant and flexible with curricula that will address the present and future health and social care needs of society. In Ireland nurse education has moved from a hospital to a university based programme and assistive technology has been included as an optional module in the nursing degree programme in Dublin City University.

ICT : Perspectives from the Classroom A study into the use of ICT in some Special Schools in Ireland

Authors: Ann Jackson and Kieran O'Callaghan

This paper will seek to analyse the way teachers, in fourteen

schools around Ireland, currently use ICT to support teaching and learning for students with special needs. It will outline the factors that inhibit or enhance teacher autonomy in using technology in an effective and creative way.

Teachers were surveyed regarding ICT resourcing, training, technical support, software selection and the role of online support provided by various agencies and organisations in Ireland, the UK and elsewhere. As part of this survey, the authors developed a questionnaire and surveyed current policy and practice in the selected schools.

The data collected will identify specific targets for future professional development for teachers of students with special needs.

The BRIDGE Project Assistive technology against social exclusion

Authors: Claudio Bitelli, Evert-Jan Hoogerwerf and Andrew Lysley

The project funded under the EC social exclusion programme, has examined service delivery issues in rapidly developing areas of AT from a wider "European" perspective. The project aims to raise awareness among politicians and decision makers in health, education and social services, concerning the real opportunities offered by AT and the indispensable characteristics of successful service delivery models.

The final report expresses the shared viewpoints of five independent AT Centres in four European countries. In this paper we will present the major outcomes of the project, including the cornerstones of successful AT policies and the role of independent AT Centres in service delivery models, suggested by the partnership.

We believe the project to be relevant for a European discussion concerning more homogeneous AT policies and for the involvement of politicians in developing appropriate AT services for people with disabilities.

Meet, Collaborate, Learn: An Examination of the Potential of the World Wide Web to Support Collaborative Learning for Students With Disabilities

Authors: Bryan Boyle and Immaculada Arnedillo Sanchez

The new Draft Guidelines for Teachers of Students with General Learning Disabilities have highlighted the potential of Information and Communication Technology as a tool for collaborative learning for students with disabilities (NCCA 2002).

The purpose of this study was to examine how students with disabilities demonstrated collaborative learning skills while engaged with a creative group task in an online environment.

During this study, student participants from four Special Schools, located around Ireland, engaged with each other using e-mail, discussion list, live chat, audio and video conferencing software, to write a short presentation reflecting their experiences as people with disabilities in Ireland. Some existing freeware software was customised to provide participants with access to the tools mentioned above. Following several weeks of collaborating other in an online environment, student's collaborative skills were measured using a specifically developed questionnaire.

ICT in special education and in-service training

Author: Jane Brodin

This paper focuses on a study on special educators working with children with disabilities and their relation to information and communication technology (ICT). The main results from an evaluation of a National State Programme intended to train special educators in the field will be presented.

The study is based on a questionnaire answered by 618 special educators, and interviews with twenty educators and ten head teachers. The results from the study show that there is a great need of basic and inservice training in the ICT-field and that the lack of time and financial resources effect the work in the schools.

SpeakOUT: A tool for people with modest print impairments

Authors: D. G. Evans, S. H. Kurniawan and P. Blenkhorn

This paper describes the operation and architecture of a tool designed to assist people with modest print impairments in gaining support for reading text. The

architecture of the tool is novel in applying the techniques commonly used in screen readers for blind people (including the use of an off-screen model) to this type of tool.

The results of a preliminary evaluation indicate that the tool is generally useful, but the highlighting of text blocks by using lines at the edges of the block does not always convey the scope of what is to be spoken and that heterophonic homographs may be spoken incorrectly. Test subjects (all of whom spoke English as a second language) preferred the use of a less natural sounding text-to-speech synthesiser.

Parallel Session E

Outcomes in Assistive Technology

Date: Monday 1st September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 5

Chairpersons: Mark Hawley and Ger Craddock

A Cross-Cultural Analysis of Relationships between Disability Self-Evaluation and Individual Predisposition to Use Assistive Technology

Authors: Stefano Federici, Andrea Micangeli, Caterina Lombardo, Marta Olivetti Belardinelli and Marcia Scherer

The main hypothesis of this work is that the disability self-representation could be related to individual coping strategies and to assistive technology predisposition.

The WHODAS II, Endler and Parker's CISS, and Scherer's MPT-SOTU were administered to two samples of 100 University students with disability in Italy and U.S.A., in order to allow a cross-cultural comparison. The WHODAS II is a psychometric tool that let the self-evaluation of disability be scored: both the English and the Italian version of the instrument were supplied by the WHO. The Coping Inventory for Stressful Situations was administered according to the current English and Italian versions. As regards the individual's predisposition of technology use, we administered the SOTU, Survey of Technology Use.

Using data analysis the first step was the verification of the Italian adaptation of the English tests versions by comparing the factorial structures of the 2 versions through the Everett test. Afterward the relationships between the three measures were computed on the 2 samples and differences in correlation amplitudes were also evaluated. Results generally confirm the hypothesis notwithstanding interesting cross-cultural differences, supplying suggestions for training professional counselors (enabling managers) for university students with disability.

Psychosocial impact of Assistive Devices: Italian localisation of the PIADS instrument

Authors: Renzo Andrich, Federica Pedroni and Giorgio Vanni

The Psychosocial Impact of Assistive Devices Scale (PIADS) - initially developed in Canada (Jutay and Day, 1996) - is a 26-items self-administered questionnaire investigating into the perceived impact of an assistive device on one's own quality of life, this being described in terms of psycho-social indicators such as ability, adaptability and self esteem. It is assumed to be applicable to any type of disability and assistive device.

Translation into Italian language and localisation in the Italian context were carried out in 2002 by the Local Health Authority 14 Verbano-Cusio-Ossola in the Piemonte Region, as part of a Thesis of the Assistive Technology Certificate Course run by the Don Gnocchi Foundation in conjunction with the Milano Catholic University.

The resulting Italian version was field-tested by administering it to a cohort of 50 users of various kinds of assistive technologies. The validation exercise provided insight into the applicability of the instrument in service delivery practice and needed improvement. The papers provides details of such results.

Transforming ICF into assessment forms - applications to broadband telecommunications

Author: Jan Persoon

The WHO International Classification of Functioning, Disability and Health (ICF) was used to construct assessment instruments for application of broadband telecommunication projects for disabled persons. A method of "action design" was used to ascertain a minimum-bias interactive development process with developers and professionals.

The process included decisions on inclusion of domains of activities and participation, and on environmental factors. Furthermore, rephrasing of ICF codes turned out to be necessary. It turned out that consensus on instruments required 4 to 8 workshops in the design groups, and that formulation of practical items from the ICF codes, required substantial effort. The method seems useful and practitioners seem satisfied with the solutions derived.

Testing the Swedish version of the Quebec User Evaluation of Satisfaction with assistive Technology (QUEST) 2.0

Authors: Ewa Wressle and Kersti Samuelsson

Occupational therapists provide assistive devices and evaluate function and usefulness. QUEST 2.0 is a standardised instrument designed to measure satisfaction with assistive technology and services. The degree of satisfaction is ranked on a scale from 1 to 5. The purpose of this study was to test QUEST 2.0 as a method for evaluating certain groups of assistive devices.

The questionnaire was sent to clients three months after they were provided with an assistive device. To be selected, clients had to be able to fill in the questionnaire and be users of a wheelchair, walker, toilet adaptation, shower seat/chair or adapted bed. The result shows high levels of satisfaction with the assistive device and the service in the sample of 44 clients. Some clients had difficulties answering the questionnaire.

The conclusion is that QUEST 2.0 can be used to complement other evaluations, but some questions need to be clarified.

Cost-effectiveness of walkers and wheelchairs

Authors: Gunn Hellbom and Jan Persson

The aim of this study was to determine benefits for the users of walkers and wheelchairs in terms of global quality of life measures. Using a preference based instrument (EuroQol EQ-5D) general "quality adjusted life years" gained was derived. Relating this to costs (various perspectives may be used), the ratio cost/QALY gained yields an estimate of cost-effectiveness.

The study included 90 subjects that had renewed prescriptions of walkers and wheelchairs (manual and electric). Costs included investments in devices and working-hours used by OTs in the prescriptions.

The average cost/QALY gained was estimated to an order of 265 €3800. This is substantially lower than the cost/QALY gained for many new interventions decided for implementation in health care.

The study showed that these assistive devices provide high value for invested money.

Psychosocial Impact of Assertive Technology: Development of a Measure for Children

Authors: Jeffrey W. Jutai and Joseph A. Bortolussi

The overwhelming majority of the children who receive assistive technology services will use one or more forms of device over the course of their lives. Yet, we know very little about how children and their parents perceive the impact these devices make on their health and well being.

The Psychosocial Impact of Assistive Devices Scales (PIADS) is a 26-item, self-report questionnaire designed to assess the effects of an assistive device on psychological well-being and subjective quality of life. This paper reports our progress on researching and developing a version of the PIADS for children.

We have found, for example, that children and their parents differ in the relative emphasis they place on the kinds of outcomes they expect from assistive devices. Nonetheless, the essential constructs measured by the adult version of the PIADS appear to be relevant for children.

Parallel Session A

Remote Service Delivery

Date: Tuesday 2nd September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 1

Chairpersons: Siobhan Long and Caren Sax

Online Support for Persons in the Community

Authors: Geb Verburg and Burt Borthwick

A case is made for the development of online resources to support persons with disability and their families in their community and persons working with them. The paper presents motivations for the provision of online resources for persons with disabilities.

The concept of Learning Object Repositories for rehabilitation is introduced and three examples of online resources that are in the process of being developed are presented.

Giving Wings to the Service Delivery Process - New Possibilities by the RESORT Tele-Service Approach

Authors: Paul Panek, Christian Beck and Wolfgang L. Zagler

This paper describes the current activities of our research group in evaluating and continuously improving an innovative tele-service system for PC-based Assistive Technology (AT) products. Based on the outcome of the EU-funded project DE-4208 RESORT this tele-service system provides means for technical, therapeutic and pedagogical remote support for (a) the disabled users of PC-based AT and (b) for their carepersons.

The tele support is delivered via IP based network connections (ISDN, xDSL, cable, LAN, wireless LAN, etc) and is delivered from a service centre which is currently running at the Vienna University of Technology. An API is available which enables other AT software systems to access the functionality of the tele-service system and in this way to become RESORTable.

Additionally, the advantages of the RESORT approach in comparison to off-the-shelf solutions are outlined, as well as the economic potential and results from the ongoing evaluation in daily life usage while supporting severely disabled users of AT systems and their care persons.

Video Communication Technology as Assistive Technology for Intellectual Disabled People

Authors: Göran Molin and Ulf Keijer

Several trends indicate that video mediated communication (VMC) will become an important part of communication in the domestic environment. This paper considers video mediated communication (VMC) as an assistive technology. The paper is based on ongoing research where people with intellectual disabilities participate in testing the use and accessibility of video communication in the domestic environment.

This research compares the communication process through both face-to-face and video in different setups. One conclusion is that the people with intellectual disability will especially benefit from the VMC -technology. With VMC -technology they can communicate at distance in almost the same way as they do in a face-to-face communication, i.e. on a concrete and emotional level including both sign and body language.

In this respect VMC -technology can be regarded as an important assistive technology for people with intellectual disabilities and also has potential for assisting other impairments / disabilities.

Operational framework for video conferencing communication within the continuum of health care services: Case studies with the spinal cord injury population

Authors: Marie-Claude Grisé, Hélène Lefebvre, Kateri Leclair, Brigitte Whelan, Hélène Bergeron,

The study aims to describe the factors inherent in the realisation of joint intervention plans (PIIC) using video conferencing to ensure inter-institution continuity of health care delivery for the spinal cord injury patients. video conferencing technology is believed to offer innovative means to improve communication within the continuum of health care services. The specific objectives of the study are

to identify the human, operational and technological factors facilitating and/or limiting optimal use of video conferencing in the context of a PIIC.

This study uses a phenomenologic qualitative research design with eight case studies. An observation form will be used to document the behaviours of the participants and the progress of the PIIC during each virtual session and a self-administered questionnaire pertaining to the level of appreciation of the session will be completed by all the subjects. Based on the data analyses, an operational framework for virtual PIIC using video conferencing will be submitted to a focus group for validation as well as for improvements.

Remote mobility monitoring of the elderly using GSM-based mobile telemetry of accelerometer signals

Authors: C. Ní Scanail, G.M. Lyons, A. Bourke, M. Keller, M. Schnieders, K. Culhane and B. Aherne

This paper describes the development of a portable system, based on mobile telephony to remotely monitor the mobility of subjects as they perform their activities of daily living in their home environment. The system will continually monitor the person's mobility using two accelerometers and a portable battery-powered data acquisition unit. The mobility data is transmitted hourly to a specially developed central database.

Each subject's mobility trends are monitored using custom-designed mobility alert software and the appropriate medical personnel are alerted if a reduction in the subject's mobility levels is detected. The system was evaluated while remotely monitoring the mobility status of a healthy subject, and sitting, standing, and lying postures were detected with accuracies of 97%, 95% and 93% respectively.

Parallel Session B

AAC and the Internet

Date: Tuesday 2nd September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 2

Chairpersons: Ciara Fitzsimons and Martine Smith

People using Graphic Symbol based Augmentative and Alternative Communication and the Internet: Guidelines and Tools for Supporting Symbol Conversation in Web Browsing and Email

Authors: Mats Lundalv, Andrew Lysley

Many people using graphic-symbol based Augmentative and Alternative Communication (AAC) systems experience significant difficulties using the text rich Internet environment. This presentation will describe ongoing work, by the WWAAC (World Wide AAC) project, aimed at supporting graphic-symbol based information sharing and retrieval through Internet media such as web browsing and email. In particular, the paper will describe the development of guidelines for language independent concept coding. Such concept coding will provide a resource for symbol conversion between symbols sets/systems and languages. The presentation will explore the use of WordNet in its Kaon format (<http://kaon.samanticweb.org>) as a base ontology onto which proprietorial symbol ontologies may map. (WordNet is an online lexical reference system developed at Princeton University USA, which is currently being used as a template for building corresponding systems in other languages (<http://www.globalwordnet.org/>). The WWAAC project is partially funded by the European Union's Information Society Technologies (IST) initiative.

Mobile Videophones and Distant Signed Language Conversation

Authors: Kazuo Kamata, Takeaki Shionome and Hideo Yamamoto and Susan D. Fischer

Mobile videophones have been now commercially available

in Japan. The devices require one-handed signing when we use them for distant signed language conversation.

We investigate the effectiveness of videophones for distant signed language conversation in actual situations by three experiments:

(1) One-handed signing experiment to investigate whether a deaf signer can express sentences well with only one hand

(2) Comprehension experiment to measure how well a receiver can understand one-handed signing expressions.

(3) Conversation experiment with real mobile videophones to investigate functionality and usability of the devices. These results show that mobile videophones can be effectively used for the signed language conversation, although there are certain issues to be improved.

More than words: characterising symbol use in special schools

Author: Chris Abbott

During 2002, a research project in the Department of Education & Professional Studies at King's College London, supported by the Nuffield Foundation, collected data regarding the current use of symbols (Widgit Rebus, Makaton, PCS, Bliss etc) in special schools.

All special schools in England were surveyed and the response rate was over 60%, providing extensive data related to the modes of symbol use, the ways in which symbols are used and the future needs of symbol users and their teachers and carers.

The paper summarises the main findings, which demonstrate a rapid increase in symbol use, and then goes on to identify issues arising from other comments made by respondents.

Improving Access to the Internet Within the AAC Community

Authors: David Poulson and Colette Nicolle

This paper presents some of the work of the EU WWAAC (World Wide Augmentative and Alternative Communication), which aims to make the electronic highway more accessible to people with cognitive

and communication impairments, in particular those using symbols instead of text to communicate.

The paper describes the approach followed in the project in developing an adapted Web browser tailored to the needs of the AAC community, and also provides an overview of the additional developments taking place in the project to specifically support symbol-based users in accessing Internet-based services.

The development of a concept coding scheme to facilitate communication between symbol users is outlined, along with the project's contributions to the development of WWW accessibility guidelines.

Grammatical support for sentence and phrase construction for symbol users

Authors: Tina Magnuson and Sheri Hunnicutt

In an EU project (WWAAC) with the goal of making Internet services more accessible for persons with language and/or cognitive impairment, a language support module has been developed to assist symbol users in email and e-chat construction. The module is composed of three functions: symbol-to-text transformation rules, ready-made reusable phrases, and grammatical model sentences and phrases for semantic symbol substitution.

The module, integrated with email software, will be evaluated in 1) an alpha version evaluation workshop with 2-4 users in three project countries, 2) a similar beta evaluation workshop in five countries, and c) a four-month experimental study in five countries.

Graphic Signs Communication Systems Analysis using WWS 2000

Authors: Leonor Moniz Pereira, Elisabete Saragoça, Luísa Canto Loura and Cristina Espadinha

Within ALDICT (Access of Persons with Learning Disabilities to Information and Communication Technologies) of TIDE programme we had developed a methodology for the evaluation of a software programme using several graphic signs communication systems and the Roman alphabet in four European languages for Communication Signs Users with Mental Impairment (MI).

The participants came from France (26), Germany (33), United Kingdom (28) and Portugal (21). The users were evaluated according to their communication abilities and computer skills, taking into account: the motor abilities to use the input devices; the interface usage; the user's motivation; the type of occupational/work/leisure activities; and the common interests that might facilitate the approach between them.

The Writing With Symbols 2000 (WWS 2000) software enables the MI users' to communicate with different graphic sign systems and/or the Roman alphabet without having to perform complex tasks. It was possible to use different graphic signs and photos. The programme allows the graphic user interface (GUI) personalisation and to create a users word lists. Some results are presented concerning the programme accessibility, the users communication abilities using graphic signs, teacher's expectations and programme acceptance.

Parallel Session C

Biomechanics

Date: Tuesday 2nd September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 3

Chairperson: Joan Hurley

Design Considerations in active orthoses for tremor suppression: Ergonomic Aspects and Integration of Enabling Technologies

Authors: Mark Heath, Mike Topping, Richard Huxley, Paul Hawkins and John Williams

The work discussed in this paper is part of a multinational collaborative project funded under an EC Fifth Framework Programme contract No (No QLK6-CT-2002-00536).

The project, DRIFTS (Dynamically Responsive Intervention For Tremor Suppression), aims to develop innovative solutions for the development of active, wearable, orthoses for upper-limb tremor suppression. Overall design concepts of the active orthosis system are illustrated and the enabling technologies being considered by the DRIFTS project consortium are discussed.

The paper goes on to illustrate potential schemes for the integration of components and subsystems into practical wearable orthosis structures, prototypes of which are planned to be evaluated in the DRIFTS Project. Finally, the ergonomic aspects of the active orthosis design are explored, including anthropometrics, pressure and shear, microclimate and user operation and maintenance.

The classification of prehension of tools by the number and the position of force vectors

Authors: Yoshiaki Seimiya, Masayuki Soma, Osamu Sueda, Masafumi Ide, Masayuki Booka, Jiro Yonezaki

Persons with functional disorder of hands could not use some of I tools in daily living because of insufficient number and improper positioning of force vectors for handling

them.

We analyzed the number and the position of force vectors required in handling 444 tools used in the evaluation of Activities of Daily Living, ADL and classified the hand movement into 35 types of operation. This classification table was useful for the evaluation of the ability of handling tools of persons with functional disorder of hands.

Consideration on Independent Transfer Using an Assistive Device with Functions of Power Assistance and Motion Guidance

Authors: Kiyoshi Nagai, Isao Nakanishi, Hideo Hanafusa, Yoko Takahashi and Hitomi Bunki

We discuss the adjustment of power-assistive devices for independent transfer for of both older people and people with disabilities on gate function.

We have already developed a prototype of the power-assistive device, and found that it is useful to adopt a control method producing assisting functions of the Power Assistance, which lends force to the user in motion, and the Motion Guidance, which leads the user through the required motions while helping the user keep the appropriate postures. In this paper, we define the adjustment and describe the concept of the adjustment with a user model.

The results of experiment by a user who simulates a person with disabilities on gate function are described.

Grip-Force Tracking in Patients with Neuromuscular Diseases

Authors: Gregorij Kurillo, Anton Zupan, Tadej Bajd, Bojan Ceru

In the paper a grip-force tracking system for hand functionality assessment is presented. The system consists of a grip-measuring device assessing the force applied indifferent grips. The device was used as input to a tracking task where the patient applied the isometric grip force according to the visual feedback from the computer screen. We analysed the task performance of 14 patients with neuromuscular diseases.

The patients performed the tracking task with five different

grips using the dominant and non-dominant hand. Two functional groups of patients were identified based on their tracking performance using k-means algorithm. The results suggest that no significant correlation exists between the maximal grip strength and tracking error.

Tremor Movement Analysis Technoques: an Approach towards Ambulatory Systems

Authors: J. M. Belda-Lois, J. Sanchez-Lacuesta, M. J. Vivas-Broseta, E. Rocon, L. Bueno, J. L. Pons

Ambulatory systems intended to supress tremor require to measure the contribution of any joint to tremor at tip level. Furthermore, intended instrumentation should be small and light in order to facilitate the integration into the orthosis. Taking into account these considerations, two different technologies have been considered as good candidates for tremor measurement: Extensometric goniometers and gyroscopes.

Approaches shown in the paper try to cover both tremor and onset detection and frequency tracking algorithms. Information extracted form these techniques will feed the control algorithm for tremor supression.

Discussion on Control of Tremor Supression via Biomechanical Loading

Authors: E. Rocon, L. Bueno, A. Ruiz, R. Ceres, L. Calderon, J. L. Pons

This paper discusses two possible control strategies to supress tremor with orthotic (wearable) devices. These two strategies are based on biomechanical loading and notch filtering the tremor with internal forces. In order to validate both concepts, an active orthotic device is briefly introduced. At the end of the paper, a discussion presents what particular aspects are more relevant when analyzing wearable concepts for tremor supression.

Parallel Session D

Product Development and ECU

Date: Tuesday 2nd September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 4

Chairpersons: Bob Martin and Donie O' Shea

Low Budget Commercial Development of a Transfer Aid: A Case Study

Authors: Lawrence Normie, Guy Bezalel and GeronTech,

In 2002, our centre undertook an experiment in low cost commercial development of assistive devices. The first product selected for the study was an improved design of sitting-to-standing transfer aid for people with reduced mobility. Up to this point, the centre granted seed finance to start-up companies for the support of carefully screened R&D proposals concerning assistive product development.

Typical projects had budgets of several 100,000, with development times of up to four years. In contrast, the transfer belt project was estimated at less than EUR 20,000 and six to eight months duration. Nevertheless, the project incorporated all of the key processes of a regular product development programme, such as market research, requirements analysis, iterative prototype development, industrial design, patenting, user trials, standards compliance, pilot production, and market testing.

This paper documents in detail the transfer belt project through its various stages of development from concept screening to market introduction.

Alternative Access to Product Information on Consumer Packages in Supermarkets and in Smart Home Environments

Authors: H. Heck, D. Clemens, F. Reins, D. Carus, and M. Doyle

Many consumers, especially elderly, blind or visually impaired people, have problems in accessing product label

information on foodstuffs and household detergents. The idea for the "universal access to product label information" is based on the identification of a product via its bar-code (EAN), an automatically generated query to a product database and a customised presentation of product information. These functions are provided by an info-device called 'TeleEye'. It enables even blind users to distinguish products at home and supports visually impaired people at shopping in supermarkets.

Since it is able to check product descriptions for user-individual ingredients (for diet or allergy) and to produce corresponding warnings, especially elderly people with special dietary needs benefit from the system.

The Internet-based European consumer product database system, the management of ingredient and diet specific expert knowledge, and the users' info-device are realised in private and public applications within the European IST-project PACKAGE.

Development and integration of package opening devices with a flexible robot in a SMART home environment

Authors: Gunnar Bolmsj, Ulf Lorentzon, Mikael Vatau, Mike Doyle, David Carus and Mike Topping

This paper presents results from the project PACKAGE based on assistive technology to open packages. The project has developed a set of different tools based on user needs. This paper will focus on an automatic device, Magic-Hand, that opens packages with screw tops. A similar automatic device, Magic-Slice was also developed for packages that require a cutting action .

The project is within the theme of 'Design for All' and extensive user based functional analysis has been conducted during the project work . The resulting prototypes from the project are currently under going user trials and indicative results are promising. The devices are integrated in kitchen units not to disturb the feel of a normal kitchen. Future developments include the integration of these devices in a smart home environment including a flexible robot.

Cooperation with the project MATS for this purpose has been initiated.

The Development of a Motorised Assistive Device for the Removal of Therapeutic Elastic Stockings

Authors: Gert Jan Gelderblom, Edith Hagedoren, Thijs Soede

Therapeutic Elastic stockings are used in large numbers to counter the effect of a number of medical conditions. Pulling the stockings on and off is however a notorious problem connected to the use of stockings.

The availability of a number of relatively simple aids to overcome these problems have not lead to the problems being solved, still a substantial amount of professional care is daily spent solely on the removal of stockings. In the Netherlands a motorised device has been developed that enables the user to remove their stockings independently. iRv has participated in the development of this device through a number of evaluations and usability studies. T

he resulting product is introduced on the Dutch market this year. This introduction is however accompanied with problems connected to the reimbursement on the device.

Parallel Session D

AT and Older Persons #2

Date: Tuesday 2nd September 2003

Time: 11:00 - 12:30

Venue: Veterinary Building - Room 5

Chairpersons: Tom Kehoe & Dr David Stratton

Multi Functional Call Center for Disabled and Elderly People

Authors: Santiago Aguilera, José Colás and Eduardo Campos

At the present time, there are two main tele-assistance services for Disabled and Elderly People in Spain: a Relay Services Centre for allowing communication between deaf and hearing people through the telephone network, and Emergency Services for allowing elderly psychological disabled people independent living. These centres work in an independent way without interrelationships between them. We are developing a project, granted by the Spanish Work and Social Services Ministry, focused on the study of potential teleassistance needs for Disabled and Elderly People, and the development of the appropriate Relay Services Centre specifications. The objective is double: economical, based on a resources optimisation, because there are many services useful for different disabilities which need the same infrastructure to work, and to improve the services quality being ready for supplying future services to new disabled people from the same centre.

Falls And Telecare Evaluation

Authors: Emma Kelly, Simon Brownsell and Mark S Hawley

There has been considerable interest in providing assistive technologies and telecare solutions to enable people to stay in their own homes for longer. However, there has been little formal evaluation of these technologies.

This study of 60 older people evaluates the success of automatic fall detectors against a nonintervention control

group. Standard assessment tools are utilised to provide robust results evaluating the impact that fall detectors may have on the fear of falling in conjunction with feelings of morale and well-being experienced by users.

The provision of fall detection units and any subsequent alteration in stress levels experienced by carers of older people is examined within the wider proposition that fall monitors can enable people to live in their own homes with a greater feeling of independence and safety. This paper provides an initial overview of the baseline results collated. Project completion and subsequent analysis are anticipated by August 2003.

Integrated Alert & Communication System for Independent Living of Older Adults

Authors: Erwin Fugger, Andreas Hochgatterer, Barbara Prazak

In order to cope with rising health expenses and a shortage of services especially in the home care sector, new strategies tend to keep elderly people at home as long as possible. However, to leave older people at home without putting them in danger, requires reliable security systems combined with user-specific communication tools, which allow the periodic evaluation of a persons' health and vitality status.

As an answer to these requirements, ARC Seibersdorf research has been developing a passive monitoring solution for solitarily, predominantly older adults, who need more or less regular care and monitoring, combined with advanced communication aids.

The proposed paper describes the development of the intelligent user interface and features of the integrated alert & communication system.

Telemonitoring for frail elderly : Is it relevant?

Authors: Claude Vincent, Isabelle Deaudelin and Mathieu Garceau

There is no rigorous study showing the effects of a telemonitoring system with voice feedback features, emergency call button and Info-Health monitoring centres with an elderly population. The object of this paper is to

identify what the effects are of the use of telemonitoring technology on; life habits (e.g. medication compliance, medical appointments); quality of life; burden on caregivers (e.g. psychological stress related to risk of falls); and client's satisfaction. A series of chronological measures taken before and after the introduction of the technology on a 6 month period was set.

The sample consists of 100 senior citizen and their caregivers. In total, 300 home visits lasting an average of 75 minutes were performed by trained research assistants. Eight measurement tools were used. Preliminary results (n=40 at T2) show that there is a significant difference between T0 and T2, and it is for the caregiver burden. Daily living support and the preoccupation about well-being have decreased for the caregivers since installation of the telemonitoring service.

Parallel Session A

User Involvement

Date: Tuesday 2nd September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 1

Chairpersons: Martin Naughton and Geraldine Prunty

Involving elderly and cognitively disabled people in the development of user requirements for advanced technologies

Authors: Lynda H. Webb, Peter W. Jackson, Mark S. Hawley

User requirements definition is fundamental in the development of advanced technology and associated services. Elderly and disabled people were involved in user requirements definition for the design of an assistive technology (AT) product, LOCOMOTION, a mobile phone extension of the community alarm concept, with location of the caller by advanced GPS.

Older people, people with dementia, people with mild learning difficulties and their carers participated in a multi-method approach. Focus group, in-depth interview and questionnaire methodologies enabled the participation of these marginalized groups. Barriers to participation, and research strategies employed to overcome them, are discussed. This paper demonstrates the central role of people with disabilities in the early stages of the AT development process.

Assistive Technology and Employment: How to ensure that people with disabilities can succeed in the workplace

Authors: Siobhán Long and Kate Raymond

For AT to be effective, users must be able to access quality training and supports which enable them to harness AT in ways which make a meaningful impact on their lives. Enable Ireland Dublin Adult Services secured a grant from the East Coast Area Health Board in 2001 which led to the

establishment of the SEAT (Supported Employment and Assistive Technology) Project. Enable Ireland's Dublin Adult Services and its National High Tech AT Service are working in partnership on this project which focuses on delivering information, advice and AT equipment to users who are either already working or have identified employment as a key goal in the Person Centered Planning process. This paper will identify the supports (both technical and personnel) which have proven key to the successful integration of AT into the workplace. This paper will summarise lessons learned during the delivery of this innovative project.

User Participation at the Development of Broadband Communication Applications

Author: Ulf Keijer

Broadband communication is rapidly emerging as the principal digital connection to homes, workplaces and institutions in Sweden and elsewhere. This generic technology is supposed to benefit all citizens, including people with disabilities. An umbrella project is currently conducted with the purpose to investigate the benefit and value of broadband communications for people with a variety of disabilities.

Presently six specific subprojects are launched, comprising a service centre for deaf-and-bl inds, information and communication for intellectually disabled persons, fast delivery of talking books to university students, remote learning for persons depending on sign language and for persons suffering from mild aphasia, respectively, and remote job counselling to people with different kinds of disabilities.

User participation is a governing principle in all these projects. Evaluation procedures will be based on the ICF model.

Introduction of assistive technology in daily life of elderly people - A qualitative interview study

Authors: Lilly Jensen, Elisabeth Kampmann Hansen, Bettina Paulsen

A qualitative study with interviews of 10 elderly people and with 3 focus group interviews of professionals working in

the service delivery of assistive technology was performed in order to qualify the service delivery of assistive technology.

The results show, for example, that the elderly and the professionals do not always agree about the aim of the process and that the elderly, according to the professionals, are easy to satisfy, although the elderly in the interviews express uncertainties and emotions about the use of new assistive devices. Therefore a usercentred approach is necessary.

The study reveals many other aspects, which are important to take care of in the process of service delivering of assistive devices. A guideline for good practice of service delivery of assistive technology for elderly people has been elaborated.

Parallel Session B

Hearing Impairment

Date: Tuesday 2nd September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 2

Chairpersons: Mick O'Connor and Niall Keane

A Survey of AT for Deafblind People: State of the Art and New Developments

Authors: M.A. Hersh, K. Worrall, M.A. Johnson

This paper discusses design and other issues involved in developing assistive devices for deafblind people. The focus is on assistive communication devices, for which a design generic structure is developed, but a similar approach can be applied to other types of assistive devices.

The design principles are then illustrated by a communication glove developed at the University of Glasgow.

Compensation of Severe Sensory Hearing Deficits. Two Different Approaches to Replace Inaudible Speech Elements: Re-Sampling Versus Re-Synthesis.

Authors: D. Bauer, A. Plinge and W.H. Ehrenstein

People who suffer from severe auditory high-tone losses would greatly benefit from replacement or selective enhancement of speech elements or speech features. We have tested two basically different technical methods of frequency transformation that are suitable for implementation on wearable DSP-add-on equipment in a C++ simulation: The first procedure consists of straight frequency transposition through re-sampling and digital interpolation. Here, intrinsic spectral and temporal relationships are more accurately preserved but can be perceptually matched only to a minor degree.

The second one consists of controlled selective re-synthesis of pre-selectable speech elements – such as /s, z, C, t/. This method features deliberate re-synthesis of the replacement

sound, which then can explicitly be matched to the characteristics of the residual auditory system.

Listening tests show that low-processing-cost realisations of both methods are useful, the range of applicability, however, is different.

Psychosocial Outcomes of Hearing Aids

Authors: Jeffrey Jutai and Gabrielle Saunders

This study examined hearing-specific and generic measures of hearing aid outcome in order (a) to determine their relative sensitivity to hearing aid use and (b) to examine the relationship between pre-hearing aid use expectations and post-use outcomes.

Ninety-two hearing impaired individuals completed some combination of the Abbreviated Profile of Hearing Aid Benefit, Expected Consequences of Hearing Aid Ownership, Satisfaction with Amplification in Daily Life and Psychosocial Impact of Assistive Devices Scale, along with providing reports of their daily and life-time hearing aid use.

Results showed that with time, outcomes improve and pre-use expectations are generally not met until individuals have worn their hearing aids for at least 1 year. Between-questionnaire comparisons showed the generic measure (PIADS) to be as sensitive to outcomes as the hearing aid specific measures. It is suggested that generic measures have some advantages over hearing specific measures, but that each has a place in the clinic.

Augmentative and alternative methods for hard-of-hearing people's telephone communication

Author: Jan-Ingvar Lindstrom

At least 10% of the population in any industrialised country have hearing problems – ranging from mild and moderate to no hearing at all. The use of telephones, despite an increase in e-mail communication, is still one of the most important means of remote communication. Therefore, helping people with hearing deficiencies to make use of the telephone is most important.

There are quite a number of methods available, and more are under development. In this paper, about a dozen methods and technologies are described. One category

builds on the use of the telephone with various augmentative facilities, another category relies on auxiliary devices, a third one on alternative means and yet another one a combination of methods.

Together with the methods, technical, social and economical implications are briefly discussed. In particular, one of the emerging methods, developed in the SYNFACE project will be presented.

Parallel Session C

Robotics

Date: Tuesday 2nd September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 3

Chairpersons: Richard Reilly and Alex Stankovic

A Human Centred Design Method for Developing A Robot Appliance

Authors: E. Guglielmelli, M. J. Johnson, G. A. Di Lauro, C. Suppo, C. Laschi, M.C. Carrozza, P. Dario, A. Pisetta, Y. Perrella and G. Giachetti

Many assistive robotic systems designed to increase the independence of disabled persons are under-utilized because of their technical complexity, high cost, poor usability, and poor mapping to user needs within the use environment. The concept of a robot appliance contains within it the idea of a task-restricted robot that is low cost, modular, and an active member of a local network of both standard and information appliances.

This paper describes a methodology for designing robotic appliances and presents a design case study that considers a new concept of a robot appliance for eating. A User-Centred Design (UCD) approach was merged with the Human Activity Assistive Technology (HAAT) model, which is typically applied to validate the performance of systems for specific task and within a specific context.

This modified UCD method permits us to create the concept of a feeding system that simultaneously considers the users' requirements for a specific task within a specific environment in order to gratify users' emotional, perceptual, and psychological needs.

Robot Supported Play - New Possibilities for Physically Handicapped Children?

Authors: Barbara Prazak, Andreas Hochgatterer, Gernot Kronreif and Martin Furst

It is a well known thesis of developmental psychology that playing is a substantial part of daily life activities and a vehicle of learning in (early) childhood. A study currently carried out by ARC Seibersdorf research GmbH (ARCS) investigates how children with severe physical handicaps play in comparison with normal children.

The final goal of the study is to identify if and how the usage of up-to-date technology can provide enhanced possibilities to interact with the (toy) environment for severe physically handicapped children. First results given in this paper indicate that for this user group a toy robot system can be a reasonable solution to enable playing and learning. The paper outlines a special designed robot system for playing, learning and therapy being under development by the Group on Intelligent Robot Systems of ARCS.

Autonomous and Robust 'Beverage Serving'-Task with the Rehabilitation Robotic System FRIEND

Authors: Christian Martens, Olena Radchenko, Andreas Pape, Haiying She, Ivan Volosyak and Axel Gräser

Rehabilitation robots shall support disabled persons in daily life situations as well as in the working environment. Currently available systems of the category 'wheelchair mounted manipulators' offer support on a relatively low task level. This puts a high cognitive load on its users.

The interaction between system and user turns out to be tiresome and time consuming. To address this problem services on higher task level are required. As a representative this paper presents the realization of a 'beverage serving' task with the rehabilitation robotic system FRIEND. Starting from system's hard- and software an overview of all sub-components required for task realization is presented. First, colour image based object detection features are used for environmental recognition.

Based on this information, objects (i.e. bottle or glass) are approached and grasped by means of a visual servo controlled robot arm. Finally, the autonomous pouring process is realized by a closed control loop that uses weight information from an 'intelligent' tray.

Robotics in Rehabilitation and Assitive Technology

Authors: Gert Jan Gelderblom, Ger Cremers and Thijs Soede

This paper describes a review study into the application of robotics and related technologies in rehabilitation and assistive technology. The study originated from the awareness that advanced technologies can be made to be of great benefit to people with severe limitations, while at the same time the number of devices or systems that actually make it to the market, seems limited.

The review study set out to describe and analyse the state of the art. This resulted in a divergent collection of prototypes, projects and pilots. A description and analysis of the collection is provided. The actual material gathered in the review is too extensive to present in this paper and will be made available separately.

Parallel Session D

Service Delivery - National Initiatives

Date: Tuesday 2nd September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 4

Chairpersons: Donal Toolin and Belinda Davis

Five-year review of the Technology Liaison Service in rural & urban Communities

Author: Conor O'Sullivan

This is a qualitative view of Technology Liaison Officer's (TLO) role in a rural/urban community in the Republic of Ireland. The TLOs are part of the support service offered with assistive technology assessments and recommendations made in the Client Technical Services, Central Remedial Clinic, located in Dublin city.

The local based TLO service was setup with funding from the Horizon European initiative in 1998. This AT local support, which the TLOs provide, has now become an indispensable part of the AT service delivery provided by CTS.

This paper discusses the perspective of two clients, a service provider and a TLO regarding the support the service offers to users of assistive technology. Objectives for the future are to expand and promote this service. It proposes further collaboration with other service providers to facilitate the growing need for providing consumers with the most appropriate technologies and support to facilitate their needs.

Strategy for reducing disabling barriers in Norway

Author: Toril Bergerud Buene

This paper will present the strategy for introducing Universal design and principles behind Planning for All in Norway. An official commission presented a strategy for the dismantling of Disabling barriers through a report called From User to Citizen (Fra bruker til borger, NOU 22:2001).

The commission's report takes an open and critical view of what has and what has not been achieved to improve accessibility to public areas. A white paper is expected to be presented to Parliament this spring. So far a project group with representatives of 8 Ministries has made a platform for implementing universal design into all Ministries. The present paper will present the Norwegian strategy and give examples of initiatives taken so far.

Analysing User Needs and Developing Systems for Provision of Assistive Devices in the Southern African Region

Authors: Tone Øderud, Mitch Loeb, Arne H. Eide and Geir Tyrmi

Relevant ministries and organisations of people with disabilities, together with universities and research institutes in the Southern African Region and Norway have recently carried out joint research studies aimed at documenting the living conditions among people with disabilities in Namibia and Zimbabwe. Based on the results from these surveys, and supplemented by national surveys, a concept for developing Local Rehabilitation Workshops (LOREWO) providing assistive devices and rehabilitation services is currently being implemented in Namibia and Zimbabwe.

The paper will briefly describe the two projects and focus on analysing user needs by undertaking living condition studies and empowering people with disabilities through their active involvement in research and development projects.

The projects are funded by Norwegian Agency for Development Cooperation (NORAD) / Atlas-alliance.

CompTIA - Serving the IT community

Author: Matthew Poyiadgi

Parallel Session E

Assistive Technology for Play and Involvement

Date: Tuesday 2nd September 2003

Time: 13:30 - 15:00

Venue: Veterinary Building - Room 5

Chairpersons: Patricia Noonan Walsh

They Play and Learn to Play! First Results of the Italian Research Project on Play and Children with Motor Impairment

Author: Serenella Besio

The results are presented of the SIVA research project "Technical Aids and Methodologies for the Access to Play for Children with Motor Impairment" (2000-2003).

The project has been launched with the scope of improving learning of children with motor impairment by letting them directly interact with their environment through play. For the 6 children belonging to the experimental group individualised solutions to access play and toys have been studied and experimented.

An onpurpose playroom has been equipped with the needed technological solutions; individualised educational programs have been developed and fulfilled.

Kids Click and Learn: Meeting the Literacy Needs of Disabled Children and Youth using Language Rich Multimedia Applications

Author: Diana P. James

This document explains how inexpensive commercial multimedia software can be creatively adapted to increase language learning and literacy skills.

Language rich multimedia software technology supports and aids children in learning both basic and more complex language and literacy tasks. Exciting interactive multimedia helps learning disabled students construct mental language

models that aid in the organisation and recall of mentally stored information.

Blindstation: a Game Platform Adapted to Visually Impaired Children

Authors: Sébastien Sablé and Dominique Archambault

The TiM project intends to develop and to adapt computer games for visually impaired children. A game platform, the blindstation, was developed to adapt existing content or create some new games. It provides a set of Python functions to describe those games in an abstract way, independent from their representation.

The platform can then render the game in a multi-modal way using the screen, keyboard, mouse and joystick, but also using some specific devices like a Braille terminal, 3D sound, a tactile board or a speech synthesizer. The rendering is done according to an XML style sheet which describes the available resources.

It can be customized depending on the available devices but also on the user's choices and disabilities. Several games have already been developed in different types (action, adventure, exploration...) and are currently tested in schools specialized in visually impaired children.

Electronic music interfaces for people with disabilities: Do they lead anywhere?

Author: Tim Swingler

This paper addresses three questions.

1. However profound an individual's degree of sensory or physical impairment may be, very strong responses to music and sound can frequently be observed. In this context, how useful are electronic interfaces which give the player control over various kinds of sonic events?

2. The extent to which people with disabilities are able to create music which has authenticity and is satisfying and motivating to the player, and the extent to which electronic interfaces allow individuals with disabilities to create music of a comparable standard to their non-disabled peers, should be the criterion against which claims about the 'liberating potential' of new technology are measured. To what extent can such claims be substantiated by the

available evidence?

3. How are we to make sense of the 'sonic behaviour' of individuals who are non-verbal?

Evaluation process based on user's need: ergonomic evaluation of multimedia games for visually impaired children

Authors: Aurélie Baud, Dominique Archambault, Benoît Roussel, Patrick Truchot

The evolution of the design methods in order to create products answering of users needs, pass by the integration of the human sciences. These disciplines such as the ergonomics, the psychology, the sociology (.), allow better understanding of needs and human behaviours in front of product. The TiM project (Tactile Interactive Multimedia computer games for visually impaired children) intends to offer to young visually impaired children the possibility of playing computer games in an autonomous way.

The computer games must be adapted to users needs. To achieve this goal, this project integrates the human factor in this development process, namely during the evaluation process. Through this project, this paper suggests presenting ergonomic evaluation, more specifically usability testing, of the computer games for young visually impaired children (3 to 10 years old). Traditional measures of usability such as productivity aren't appropriate to evaluate children's application. The indicators should be .challenge., .control. and .satisfaction.

In order to improve and design new games, the results concern essentially the sound and tactile interfaces. The recommendations allow to the blind children to navigate and to localise easily in the game.

Wheelchair Football Devices

Authors: S. Halsey, D. Meegahawatte, R. Faulkner and R.Orpwood

A device has been developed that fits onto the front of a wheelchair to enable the user to trap, control, and then shoot a football at the press of a button. The ball is trapped automatically and then a motor/spring arrangement provides the force for propelling it out again. It has been

tested in a two-player situation with encouraging results. Each stage of the development has been guided by feedback from wheelchair users.

The device enables children in wheelchairs to experience playing football with their peers and with other wheelchair users. In addition to the work done on powered wheelchairs, there has been some research into a device for use on a manual wheelchair.

Parallel Session A

Interdisciplinary Practices

Date: Tuesday 2nd September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 1

Chairpersons: Michael McCabe and Dr Sylvia Dockery

Interdisciplinary Approaches to AT: The Barriers and How to Overcome Them

Authors: M.A. Hersh and G. Moss

A brief survey of the literature on interdisciplinary work is presented to introduce a questionnaire on current interdisciplinary practice in assistive technology.

Preliminary results of the survey are presented and used to make some suggestions for good practice.

How can interdisciplinary teams serve nursing homes?

Author: Reidun Skøien

The objective of this paper is to discuss the challenges Occupational Therapists meet in their interdisciplinary co-operation in preventing pressure sores at nursing homes. The purpose is to find better ways for transfer of knowledge to nursing assistants and unskilled nursing personnel.

To expose the level of competence, nine occupational therapists working at nursing homes were interviewed about their practical work with patients.

The study revealed problems in co-operation due to lack of knowledge and low motivation among nursing personnel. Registered nurses were often absent in the daily work and many of the nursing personnel were unskilled. Thus the occupational therapists were concerned about the follow-up of patients. Motivation and interest seemed to vary in the different nursing homes.

It seems to be of vital importance for management to take responsibility in health promotion to create interest and

motivation among personnel. To strengthen the competence in the future, interdisciplinary teams composed of occupational therapists, registered nurses and others would perhaps induce better co-operation to serve nursing homes with seminars and training.

Building Capacity through Interdisciplinary Collaboration

Authors: Caren Sax, Dawn Duffin and Bryan Boyle

Learning about assistive technology (AT) devices and resources, assessment approaches, and strategies for interacting on interdisciplinary teams provides professionals in disability-related fields essential skills to offer quality services related to employment, education, and independent living. Historical context, recent research and development, and practical experience are necessary components of effective training and educational programs. Many models for training exist; however not all incorporate the factors that result in interdisciplinary collaboration.

This collaboration requires at least the following: identifying a common purpose, recruiting committed partners, developing relationships among partners, and building capacity from within the system or organization. This paper describes the development of an interdisciplinary model for identifying and meeting AT training needs created by an international partnership using proactive leadership and "boundary-crossing" across organization parameters.

Strategies for assessing training needs and examples of training curriculum are included.

Partnership In Practice: Working Together to Deliver Quality AT Services In Ireland and the U.K.

Authors: Siobhán Long and David Banes

Enable Ireland and AbilityNet UK established a partnership in 2000 in order to explore ways in which both organisations could benefit from sharing expertise, experience and skills. The development of quality inservice training initiatives, together with the exploration of shared assessment services were two of the priorities identified prior to the initiation of the partnership. In the intervening two year period, a number of additional benefits have emerged from our joint working experiences.

These include: cascading impacts of heightened AT awareness among AT users, potential users, other service delivery organisations and the general public; greater willingness to embrace AT as a core feature of service delivery and increased awareness among funders of the centrality of AT in user's lives. This partnership continues to evolve, and offers, we believe, a valuable insight into ways of achieving exponential benefits from limited resources in delivering AT Services.

Quality Recommendation for Assistive Technology Services

Authors: Outi Töytäri, Anna-Liisa Salminen and Tuula Hurnasti

The National Research and Development Centre for Welfare and Health, STAKES, has prepared the proposal for the quality recommendation concerning assistive technology services in Finland. A wide range of professionals and technical-aid users co-operated in the preparation. The methods in this iterative process included expert group working, e-mail discussions and consultation meetings.

The aim of the recommendation is to improve the quality of assistive technology services and to promote equality among technical-aid users. The quality recommendation is an instrument to plan, improve, follow up and evaluate assistive technology services. The recommendation is targeted at decision-makers.

The recommendation was written using the perspectives of three groups:

- (1) users of assistive technology,
- (2) professionals and
- (3) municipal decision-makers.

It deals with four key themes:

- (1) quality of the information on assistive technology services,
- (2) client-centred practice,
- (3) staff competence and
- (4) co-operation, responsibilities and division of labour within the service system.

Parallel Session B

Design for All - Product Development

Date: Tuesday 2nd September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 2

Chairpersons: Barry McMullin and Andrew Lysley

A Concept for Context-Sensitive Word Predictions in a Public Terminal Environment

Authors: Olaf Perlick, Dirk Clemens, Helmut Heck, Frank Reins and Rainer Wallbruch

Many handicapped people (blind, motor impaired, mentally retarded) have problems in accessing public terminal systems. In the concept developed within the EMBASSI project, personalized assistants (PDAs) are used as clients for the remote control of public terminals. They may apply diverse input and output modalities and other assistive components specific to a particular user.

The services provided by public terminals are dynamically recognised by the user's PDA. Assistance functions, like dynamic interface customization, application shortcuts, or word prediction help to minimise the user's interaction effort and cognitive load. The paper focuses on the application of word prediction based on situational contexts in order to facilitate text entries. The concept of word prediction with the merge of application specific and personal specific dictionary systems is discussed and compared to desktop PC applications with word prediction.

The work in EMBASSI is co-funded by the German Ministry of Education and Research (BMBF).

The FRR Project: Developing a More User Friendly Rest Room

Authors: Paul Panek and Wolfgang L. Zaglerf

This paper describes the RTD project FRR (Friendly Rest Room) which is partly funded by the EU in the Quality of Life programme. The objective of the FRR project is (a) to

create prototypes of more user friendly rest rooms for old persons and for persons with disabilities and (b) to gain applicable knowledge about specific needs and wishes of old and/or disabled persons and their care persons concerning rest rooms.

The FRR project is using a user driven research approach implemented by three test bases in Sweden, Austria and Greece which have already carried out the first user tests on prototypes. The outcome of the user tests and the user investigation via paper questionnaires and computer based interviews provide input to the design and engineering process which is running in parallel aiming at specifying and implementing improved prototype generations.

The paper also describes ethical considerations which accompany the high level of user involvement.

Built-in versus bolt-on; prospects for universal design

Author: Bill Haneman

Historically most accessibility tools for systems and applications have taken the form of "aftermarket"-style modifications to existing products. Moreover, the techniques used to create the complex off-screen models on which these adaptive technologies rely have been fragile, invasive, and typically unsupported.

Today there is an increasing call for "universal design" as a guiding principle in the fields of accessibility; the reality of most software development platforms and environments seems remote from this ideal. Using the example of the GNOME Accessibility Project, we will discuss the concept of accessibility by contract and its role in making universal access an explicit goal during the design and development of desktop platforms, operating systems, and toolkits.

We will also discuss how universal access at the system and service level can enable specific solutions to user needs, and the impact of the API/service approach on AT and accessible application design.

Using disability scenarios for user-centred product design

Authors: Gunela Astbrink and Waleed Kadous

This paper will discuss how the building of a disability

persona and scenario helped to clarify functional user needs in a wireless communication and information device both for people with disabilities and for the wider population. The iterative scenario development process included meetings and workshops with user and technology researchers and with technologists and members of an Expert Panel on Disability to further expand specific requirements.

The Smart Internet Technology Cooperative Research Centre, a consortium of Australian universities and industry partners, is working on creating smart personal assistants with natural adaptive user interfaces in intelligent environments using smart networks. These aim to be easy to use and seamless for the end-user. The User-Centred Design project activates processes in conjunction with the technology teams for users' requirements to be considered at the design stage. The scenario methodology has been a valuable tool for ideas interchange between technology and user researchers.

Accessibility, usability, and universal design - Positioning and definition of concepts describing person-environment relationships

Authors: Susanne Iwarsson and Agneta Ståhl

Theory development for application to societal planning issues require definition of central concepts. The aim of this paper is to position, define, and discuss concepts concerning person-environment relationships, viz. accessibility, usability, and universal design. A literature review, synthesised with the authors' research and practice experiences, was accomplished. The result suggests a three-step definition to accessibility, highlighting that accessibility comprises a personal as well as an environmental component, and that accessibility must be analysed by an integration of both.

Suggesting the introduction of an activity component, accessibility should partly be replaced by the more complex term usability, explicitly acknowledging a user-centred approach. Universal design is as a more process-oriented but less stigmatising concept. This paper contributes to the positioning and definition of concepts describing person-environment relationships. The definitions challenge current terminology, but can support in developing more efficient research and practice strategies.

Original publication: Iwarsson, S. & Ståhl, A. (2003). Accessibility, usability, and universal design Positioning and definition of concepts describing person-environment relationships. *Disability and Rehabilitation*, 25, 57-66.

PACKAGE Project: Results Of European User Trials For Easy Openable Packaging

Authors: R. Huxley, M. Topping and P. Hawkins

This paper will describe the results of the user requirements survey as part of the PACKAGE project (Provision for improved lifestyles via Access to Consumer packAGESs). The PACKAGE project is a project funded by the European Commission. The aim of the project is to demonstrate how consumer packaging can be made more accessible to disabled and older persons and to promote the concepts of an inclusive society.

This paper will concentrate on the packaging we have developed and the results from our user trials across Europe.

Parallel Session C

Initiatives in Environmental Controls

Date: Tuesday 2nd September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 3

Chairpersons: James Jackson and Eithne Frost

Usage monitoring and analysis to enhance provision of Environmental Control Systems

Authors: Simon Brownsell, Graham Newiss and Mark Hawley

Previous research by the authors suggested the clinical value of monitoring usage of integrated electronic assistive technology. We have now developed a data logger that attaches to any Environmental Control System (ECS) and time and date stamps switch activation. A computer program has been developed to determine and record selections made by the user. This approach ensures that ECSs provided by different manufactures can be modeled. Tests have indicated that the technique gives up to 95% accuracy.

This paper will briefly report on the technical features of this technique and, through a case study with an ECS user, report the trends evident and suggest its usefulness in a clinical setting. At present little is known regarding why some assistive technologies are used frequently and others not.

This approach enables information to be gathered on this important issue, ensuring an optimum technology and user fit while providing feedback into the assessment process.

Clinical Competency in Assessing for Environmental Controls

Authors: Neil Gregory and Phil Palmer

Access to Communication and Technology (ACT) is a regional assessment service based in the West Midlands Rehabilitation Centre (West Midlands Rehabilitation

Centre), Birmingham, England. ACT assesses needs for Augmentative and Alternative Communication (AAC) and Environmental Control (EC). The ACT model of EC assessment [1] involves assessment by either an Occupational Therapist (OT) or a Clinical Engineer (CE). Because of this interdisciplinary model, ACT determined the need for a measure of competency that would be applicable to clinicians working in the field regardless of professional background. This has been used as a training tool and in the future could be used as a tool of quality assurance for supervisor, Head of Department and patient.

Initially three areas of competency were identified: Clinical, Technical and Process. This was later adapted to follow the assessment chronology as follows: Clinical Planning, Expectations, Assessment, Synthesis, Goal Setting, Actions, Evaluation and Resources.

Each property of competence is associated with a dimension ranging from 0 (no knowledge) to 6 (working independently on specialised cases). Future validation will include reference to National Occupational Standards [2] and professional competencies.

The benefits of Environmental Control Units in everyday life, view of users and helpers

Authors: Anne Kanto-Ronkanen, Eeva Leino and Anna-Liisa Salminen

The Kuopio University Hospital (KUH) Device Centre in Finland has financed the installation of Environmental Control Units (ECU) for 31 disabled people. The Centre would like to further develop their services and obtain client feedback about the benefits and usability of these devices.

The objectives of the study were to describe the benefits of the ECU use in everyday life and to describe the situations where the ECUs can be used. A questionnaire was sent to all 31 ECU users who were also asked to forward the questionnaire to their helpers. Twenty-four users (77%) and 26 helpers (42%) returned the questionnaire. The results of the questionnaires were analysed by descriptive statistics and content analysis.

The door opening command was evaluated as one of the most important commands helping independence and social relationships of disabled people. The users stated that without ECUs they would be less independent and need more personal help.

Parallel Session D

Assistive Technology for Rehabilitation

Date: Tuesday 2nd September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 4

Chairpersons: Crt Marincek and Geraldine Doyle

The effectiveness of computers as an educational aid to speech and language development

Author: Elizabeth Stokes

This investigation used a quantitative pilot case study to examine the effectiveness of computers as an educational aid for speech and language development. It studies infant classes at four randomly selected special schools and a questionnaire was issued, to the teaching staff for this purpose.

The results of the present study have shown that there is theoretical, analytical and factual evidence which prove computers to be an effective computerised educational aid for speech and language development and should, therefore, be considered as an additional educational language aid alongside traditional educational aids for speech and language development.

The GENTLE/s Clinical Trial: Effect of treatment on Maximal Voluntary Isometric Contraction.

Authors: Susan Coote and Emma Stokes

Recovery of the upper extremity following stroke (UE) is less than that of the lower extremity, and the UE receives less intervention, despite the fact that its functioning is more complex. The GENTLE/s system allows increased dosage of treatment intervention for the hemiplegic upper extremity (UE).

The GENTLE/s system is the first European robot mediated therapy (RMT) project to have completed clinical trials and initial results showed positive results consistent with US findings. This study reports the effect of GENTLE/s RMT on

the force generated (MVIC) by four muscle groups, using hand held dynamometry.

The trial consisted of a series of 20 single case studies using and ABC/ACB design where A was baseline measurement, B RMT and C a period of sling suspension. Of the 20 patients who completed the trial, 13 had the highest rate of recovery for one or more of the MVIC variables during the RMT phase.

All patients exercised in active mode for varying lengths of time. There was no relationship between the increase in MVIC and any of the background characteristics measured.

Dynamic balance training improves locomotor skills in people with below-knee prosthesis

Authors: Zlatko Matjacic and Helena Burger

Falls and fear of falling are significant health problems arising from impaired balancing abilities that accompany people with lower limb amputation during unassisted transfer maneuvers and ambulation. It is important to develop and evaluate efficient therapeutic interventions aimed at improving balancing and coordination skills. A group of fourteen persons after trans-tibial amputation, fitted with below-knee prosthesis, were included in a balance-training program, consisting of app. 20 minutes of balance training per day for five consecutive days on BalanceReTrainer a novel balance-training, fall-safe mechanical apparatus.

Before and after the training period three outcome measures were taken: duration of standing only on the prosthetic leg, timed up and go test and 10-m walk. Before training the group was able to stand on the prosthetic leg for 2.98 ± 2.75 s, they needed 6.15 ± 1.9 s for accomplishing timed up&go test and they needed 5.51 ± 1.5 s to cover the distance of 10 m. After the treatment period the values were 4.3 ± 4.5 s, 5.4 ± 1.5 s and 4.5 ± 0.9 s, respectively.

The results indicate improved performance in all three measured tasks, thereby indicating that the applied treatment program improves balancing and ambulation abilities in people after trans-tibial amputation.

Introducing Restoration of Selectivity in Hearing Instrument Design Through Phoneme Spotting

Author: D. Bauer Plinge

Speech-model-based phoneme enhancement or replacement can be used to compensate losses of auditory selectivity that typically occur in people suffering from sensory hearing deficits. A dedicated phonetic spotter can serve as control unit for selectivity-restoring speech processing; it offers effective control of phoneme-specific enhancement and replacement. The future implementation in wearable low-power DSPs imposes stringent limitation on processing costs.

To find the numerical optimum of a predefined low-cost configuration, software tools have been developed in C++, which let us define a parametric model. Starting from labelling of speech material, prototypes of the phonemes to be spotted are established on the basis of a mixed statistical approach, which contains range check and a likelihood-based distance measure in the feature space chosen.

Use of Flex sensors in a hand-function biofeedback system for rehabilitation applications

Authors: Gerard M. Lyons, John Dempsey and Annette Shanahan

This paper describes a desktop biofeedback system, which analyses user's finger movements using flex sensors, displays the movements on screen as well as recording them to a database, allows the prerecording and simultaneous display of exercises to be performed and provides biofeedback to the user.

This system is designed to help physiotherapists to monitor how well a user is recovering over a period of time and also to encourage the users by showing them when they are meeting or exceeding the goals set by the physiotherapist.

Evaluation of a computer game-based EMG biofeedback system for muscle rehabilitation

Authors: Gerard M. Lyons, Puneet Sharma, Melissa Baker, Siobhan O'Malley and Annette Shanahan

The development and clinical evaluation of a computer

game-based EMG biofeedback system is described, whose purpose is to enable or disable the playing of a computer game by a user, based on the intensity of muscle activity recorded from the muscle of interest. The game can be used in the development of increased muscle function or in the suppression of muscle spasticity.

Biofeedback is provided as the system allows the subject to control game play using muscle contraction/relaxation. A built-in calibration mechanism caters for varying muscle sizes and strengths. Clinical evaluation of the biofeedback system, for muscular rehabilitation, has been carried out on 8 adult subjects with cerebral palsy over a four-week period.

Parallel Session E

Interface Issues - Computer Access

Date: Tuesday 2nd September 2003

Time: 15:30 - 17:00

Venue: Veterinary Building - Room 5

Chairperson: Simeon Owens

The person and prosthesis interface: the role of psychoprosthetics

Author: Dr. Pamela Gallagher

Psychoprosthetics explore the psychological factors at play in the adaptation to prosthetic devices. This paper will report on a series of studies that investigates the psychological perspective on prosthetic use and adjustment in adults with a lower limb amputation and as such begins to explore the person/technology interface from the perspective of limb prosthetics. In particular, it will review the role of meaning attributed to limb loss and prosthetic use, and quality of life in people with a lower limb prosthesis, and their relationship to subsequent adjustment.

It will also discuss the development and ongoing use of the Trinity Amputation and Prosthesis Experience Scales, a multidimensional self-report questionnaire designed to better understand the experience of amputation and adjustment to a lower limb prosthesis. It advocates the promotion of a user centred approach and the importance of interdisciplinary inputs.

Usability Testing of Haptic and Auditory Interfaces for Visually Impaired Children

Authors: Roope Raisamo, Maarit Mannonen, Virpi Pasto Jouni Salo, Saija Patomaki and Arto Hippula

New ways of interaction show promise in improving the possibilities of people with disabilities. Many methods to enhance computer-mediated communication with visually impaired users have been developed but it is not yet comprehensively known how to carry out usability testing of these methods to gain reliable results.

One of the most challenging user groups is visually impaired small children since in many cases, a child cannot explain accurately what kind of problem she or he has with vision. In our tutoring system for the visually impaired children we replace the visual interface with a haptic and auditory interface.

In this paper we report on the usability studies carried out in an early phase of system development. The results have been used in iterative development of the system.

Multimodal Transactional Interaction, Communication and Navigation: A User Needs Study

Authors: N.A. Hine, S.J. Schofield, S.D. Joel, S. Furner and L. Groh

As an increasing number of daily living transactions are moving to being negotiated via the World Wide Web (WWW) or other telecommunications based services. Some users with disabilities are encountering difficulties enacting these transactions. Information input and output may require the use of media that cannot be handled by these users. The ETSI special Task Force 204 has been considering the use of alternative modalities such as speech or symbols instead of text, or text or symbols instead of audible representations. This paper will report on a user requirements gathering exercise that was conducted within the framework of this project. An initial set of issues arising from this exercise will be presented as a stimulus for further research on this topic.

A Self-training System for Text Entry With Blinking Color Imaging

Authors: Tatiana Evreinova, Grigori Evreinov and Roope Raisamo

The majority of visually impaired people would have fewer problems if they were experienced users of a conventional computer keyboard or the Braille keyboard. The goal of our work was to develop multi-sensory approach to typing training for the visually impaired persons by combining tactile and visual feedback during text input while using a conventional keyboard and peripheral monitor.

The self-training system for text entry was designed to use visual color patterns displayed with the help of a single two-

color light emitting diode coupled to glasses. Our results show that using this system both promotes the learning of the blinking coded alphabet and decreases a period of typing training.

Efficiency of letter prediction for rate enhancement in scanning type of Japanese communication aids

Author: Hidehisa Oku

physically disabled with speaking and/or writing difficulties. In these aids, elemental letters for composing messages are shown as a table. In North America and Europe, techniques such as word prediction and letter prediction, have been combined with the table for rate enhancement.

However, similar words have not been pursued so far in Japan because of linguistic difference. In this paper, a new table which has both an elemental Kana table and an additional Kana table, is suggested for rate enhancement in scanning communication aids. The elemental Kana table has forty-six Kana letters, and the additional Kana table has five Kana letters that are selected according to frequency order of coupling with a letter selected just before.

The result of evaluation indicates the efficiency of suggested table for rate enhancement.

The promise of hands-free computing - An investigation of speech recognition software and its relevance, as an assistive technology, for people with disabilities in Ireland.

Authors: Daniela Cooney and Bryan Boyle

The promise of hands-free computing would appear to open a wide range of possibilities for people with disabilities from educational engagement to vocational opportunities. Several commercially available speech recognition software packages have been used successfully by people with a wide range of abilities and disabilities.

With regard to successful usage of this software, evidence has been for the most part anecdotal. The aim of this research project is to investigate the levels of success attained by people with disabilities in the use of speech recognition software. Client Technical Services (CTS), the Assistive Technology Department of the Central Remedial

Clinic, has recommended Speech Recognition Software to suitable clients for the past 4 years.

This project involves the examination of the population for which speech recognition software was recommended, the identification of patterns of use or non-use among this group and an exploration of such identified factors. Results of this study will be presented in conjunction with some recommendations for Assertive Technology Practitioners working in Ireland.

Exhibitors

List of Exhibitors:

Ideal Technologies

SK Metalworks

Parfit

Attainment Company Inc

Sunrise Medical Ltd

ComputerSpeak Ltd

Comhairle

Prentke Romich International Ltd

Ennis Information Age Services

RSL Steeper Assistive Technology

Gary Lewis

Ash Technologies Ltd

Techcess

Enable Ireland

Sensory Software International Ltd

Easy Talk

Jackson Technology

Inclusive Technology Ltd

Lomax Mobility Ltd

CompuStore

Toby Churchill

Invacare

Edtech

Sunrise Medical

European Commission

Dublin Bus

CATA/DACA

EDEAN

Unique Prospectives

XML Workshop Ltd

The Soundbeam Project

IRISH MOTOR NEURONE DISEASE ASSOCIATION (IMNDA)

Carmichael House,
North Brunswick Street,
Dublin 7,
Ireland.

FREEPHONE:1800-403-403

Tel:00-353-1-8730422

Fax:00-353-1-8735737

Description

IMNDA offers advice and support (home visits, financial assistance for home nursing and supply of specialised equipment) to sufferers of Motor Neurone disease and their families.

THE SOUNDBEAM PROJECT

Unit 3

Highbury Villas

St Michaels Hill

Bristol BS2 8BY

UK

Tel: (0) 117 974 4142

Fax: (0) 117 921 5239

Email tim@soundbeam.co.uk

Website www.soundbeam.co.uk

Product Description:

Soundbeam is a unique musical interface widely used in special education and elsewhere.

IDEAL TECHNOLOGIES

4 Hilltown Way
Rivervalley
Swords
Co. Dublin

Phone: 00 353 (0)1 840 3345
Fax: 00 353 (0)1 840 3345

Email: info@davecarthy.com
Website: www.davecarthy.com/

Product Description:

We install environmental control systems with particular emphasis on the requirements of the physically challenged. At present we use X-10, GEWA, Picomed and Sicare technology. The environmental control systems may include items to allow individuals control their entertainment, door opening, window opening and various other activities with systems tailored to their particular needs.

SK METALWORKS

Furze Road
Sandyford Industrial Estate
Foxrock
Dublin 18

Phone: 01-2952676
Fax: 01-2955854

Email: skprod@iol.ie
Website: www.skmprod.com

Product Description:

Height Adjustable Tables, Ergonomic tables and surfaces for work and other activities.

PARFIT LTD

Cloghran
Co. Dublin

Phone: 01-8407880
Fax: 01- 8407847

Email: info@parfit.ie
Website: www.parfit.ie

Product Description:

Medical and General Mobile Specialists. We offer a comprehensive range of specially adapted vehicles to meet with each individual client's requirements.

ATTAINMENT COMPANY INC

P.O. Box 930160
Verona
WI 53593-0160
USA

Phone: (800)327-4269
Fax: (800)942-3865

Email: info@attainment-inc.com
Website: www.attainment-tinc.com

Product Description:

Functional life skills materials age-appropriate for adolescents and young adults, including software, video, books, cards and augmentative communication devices.

SUNRISE MEDICAL LTD (DYNAVOX SYSTEMS INC.)

High Street
Wollaston
West Midlands
DY8 4PS

Phone: 00 44 7960 273308

Email: dave.morgan@sunmed.co.uk
Website: www.dynavox.co.uk

Product Description:

Sunrise Medical is one of the world's largest manufacturers of homecare and extended care products including Quickie, PowerTec, Jay, DeVilbiss, Oxford, Coopers, and Sterling. Dynavox Systems Inc. provides an extensive range of dynamic screen communication devices including the Dynavox 3100 and Dynamyte, and a range of mounting systems and software packages. Sunrise operates manufacturing facilities in the United Kingdom, Mexico the United States, Germany, and Spain and our products are distributed to suppliers through dedicated sales organizations and distributors in over 90 countries worldwide.

COMPUTERSPEAK LTD

Guinness Enterprise Centre
Taylors Lane
Dublin 8

Phone: 01-677 7620, 01-410 0548, 01-410 0549
Fax: 01-4100985

Email: info@computerspeak.ie
Website: www.computerspeak.ie

Product Description:

Voice Recognition Specialists

COMHAIRLE

Hume House
Ballsbridge
Dublin 4

Phone: 01 6059000
Fax: 01 6059099

Email : comhairle@comhairle.ie
Website: www.comhairle.ie

Description:

Comhairle is the national agency responsible for supporting the provision of information, advice and advocacy on social services to ensure this access. It supports the provision of information to the public through the nationwide network of Citizens Information Centres, the Citizens Information Call Centre and and through the OASIS and Citizens Information Databases.

PRENTKE ROMICH INTERNATIONAL LTD

Whitegates
Swinstead
Grantham
Lincs
NG33 4PA, UK

Phone: 01733 370470
Fax: 01733 391939

Email: info@prentromint.com
Website: www.prentromint.com/

Product Description:

Prentke Romich International (PRI) is the exclusive supplier of Minspeak voice output communication aids in the UK. Minspeak, or 'Minimum Effort Speech', is an AAC language system for spontaneous, independent communication for people with a wide range of motor skills and cognitive ability. Devices include the Pathfinder, vantage, Springboard and Alphatalker, as well as offering a range of accessories, including switches, mounting kits and computer software.

ENNIS INFORMATION AGE SERVICES

Ballymaley Business Park
Ennis
Co. Clare

Phone: 065- 68 69 200
Fax: 065 68 69 244

Email: info@eias.ie
Website: www.eias.ie/

Product Description:

Ennis Information Age Services (EIAS) are experts in the fields of Usability, Accessibility and Marketing. We enable you to develop & market top quality technologies by focusing directly on the consumer's actual needs and abilities.

RSL STEEPER ASSISTIVE TECHNOLOGY

Unit 51
Riverside II Medway City Estate
Rochester
Kent
ME2 4DP

Phone: (01634) 297010
Fax: (01634) 297011

Website: www.rslsteeper.com

Product Description:

RSL Steeper Ltd provides products and services for disabled people in the UK and around the world. Particular areas of expertise are prosthetics, orthotics and electronic assistive technology. IconSpeak is the core communication aid supplied in a handheld touchscreen format. Several of RSL Steeper's environmental controls can also produce speech. Environmental controls enhance independent living, convenience, security and safety by allowing even the profoundly disabled to operate a wide range of devices from entertainment systems to telephones, intercoms, doors, lamps and windows

GARY LEWIS

56 Close Allt-Y-Gog
Pontarddulais
Swansea
Sth Wales
SA4 1JH
UK

Phone: 00 44 7775617895

Product Description:

Specialist equipment to enhance safety and comfort in the home, particularly for the elderly or vulnerable. Equipment includes fire safety, cooker shutoff, water shutoff and accessible tap alternatives.

ASH TECHNOLOGIES LTD

Unit B5
M7 Business Park
Naas
Co. Kildare
Phone: 045-882212
Fax: 045-882214
Email: hugh@ashtech.ie
Website: www.ashtech.ie

Product Description:

A world-leading manufacturer, designer and distributor of portable products for the Visually Impaired. Their aim is to provide portable solutions for people with visual impairments to allow access to print, thus providing more freedom to read and write where you want. We design and manufacture our own products in our premises in Ireland and currently export to over 35 countries world wide.

TECHCESS

Unit 12
Willow Park Ind Estate
Upton Lane
Stokes Golding
Nuneaton
Warwick
Phone: +44 (0)1455 213708
Fax: +44 (0)1455 213709
Email: sales@techcess.co.uk
Website: www.techcess.co.uk/

Product Description:

Techcess Ltd supplies a wide range of products that provide access to technology for people with special needs, from mounting hardware to communication systems, including the Tellus, Mind Express, Eurovocs Suite, and DaeSSy Wheelchair Mounting Systems

SENSORY SOFTWARE INTERNATIONAL LTD

26 Abbey Road
Malvern
WR14 3HD
Phone: 01684 578868
Fax: 01684 897753
Email: info@sensorysoftware.com
Website: www.sensorysoftware.com/

Product Description:

Sensory Software International Ltd is a software development partnership based in the UK providing a range of software solutions for access and communication for people with disabilities, and accessories for computers to enable them to be used as communication aids. Products include The Grid, Windbag, Mounting systems for a PC on a wheelchair, switches, head mouse and switch interfaces.

EASY TALK

90 Gracepark Meadows
Drumcondra
Dublin 9
Phone: 087-7997412
Email: easytalk@eircom.net
Website: www.dialfx.com

Product Description:

Easy talk, have developed dialfx technology which is designed for people who cannot speak or have limited speech capability. Easy Talk facilitates telephone conversations between individuals who can talk and hear normally, and those who have communication difficulties.

JACKSON TECHNOLOGY

24 Kiltipper Avenue
Aylesbury
Tallaght
Dublin 24
Phone: 01-4518508
Email: djackson@iol.ie
Website: www.jacksonstechnology.com/

Product Description:

We are a leading supplier of assistive technology in Ireland specialising in computer and print access. The products we supply allow people with a range of literacy, physical and sensory disabilities access to print and computers. We represent the worlds leading manufacturers in assistive technology and offer a comprehensive service including training, advice and technical support.

INCLUSIVE TECHNOLOGY LTD

Gatehead Business Park
Delph New Road
Delph
Oldham

OL3 5BX
UK

Phone: 01457-819790

Email: inclusive@inclusive.co.uk

Website: www.inclusive.co.uk

Product Description:

Inclusive Technology Ltd specialises in the provision of computer based special needs resources. Aim to provide: Good software for low-incidence disabilities, such as our SwitchIt! range of products. Resources for inclusion, such as 'Inclusive Writer', a powerful word processor with picture support, switch access and literacy activities. Access for SEN to 'mainstream' products, e.g. 'Instant Access packs' for Edmark CDs and Living Books. The best of 'access devices' to enable users to access the computer effectively for learning and recording.

LOMAX MOBILITY LTD

The Chalmers Building
Charles Bowman Avenue
Claverhouse Industrial Park
Dundee
DD4 9UB

Phone: (01382) 503000

Fax: (01382) 503550

Email: sales@lomax.co.uk

Website: www.lomaxmobility.com/

Product Description:

Lomax are the only remaining independent wheelchair manufacturer in the UK, and are committed to improving the products available to the wheelchair-using customer. With an innovative design approach, Lomax has produced a wide range of products to suit their customers individual needs. Our products are built for children, adults and Paralympic athletes. They are also available as manual or power. All chairs are CE marked and have passed crash testing to ISO standards

COMPUSTORE

Unit 2B Avonbeg Ind. Est.
Longmile Road
Dublin 12

Ph: 01-450 6255

Fax: 01-450 7867

Email: longmile@compustore.ie

Website: www.compustore.ie

Product Description:

Leading retail outlet for Computer equipment and peripherals

TOBY CHURCHILL

20 Panton Street

Cambridge

CB2 1HP

United Kingdom

Phone: +44 (0) 1223 576117

Fax: +44 (0) 1223 576118

Website: www.toby-churchill.com

Product Description:

Toby Churchill Ltd is one of the leading European manufacturers of communication aids, and design the LIGHTWRITER(r) and adVOCAtE voice output communication aids for people with speech disabilities. Lightwriters are text-based and are available in both keyboard models for direct entry of each letter, and also scanning models for those unable to use a keyboard. adVOCAtE is a new digital recording communication aid .

INVACARE UK LTD

South Road

Bridgend

Mid Glamorgan

CF31 3PY

UK

Phone: 01656-647327

Fax: 01656-649016

Website: www.invacare.com

Product Description:

Invacare is the industry leader in the \$6-billion market for home medical products, manufacturing and distributing the world's broadest product offering to approximately 15,000 independent, home medical equipment (HME) providers. Seating and positioning, wheelchairs and powered vehicles. Top end sports chairs and bathing aids.

EDTECH

Murrisk

Westport

Co. Mayo

Phone: 1850 923459 or 098 64886

Fax: 098 64842

Email: info@EdTech.ie

Website: www.edtech.ie/

Product Description:

We provide a comprehensive range of computer software for general and special needs education.

EUROPEAN COMMISSION

Phone: 32-2-29-68596

Fax: 32-2-29-68388

Email: ist@cec.eu.int

Website: www.cordis.lu/ist/ka1/special_needs

DUBLIN BUS

O'Connell Street,
Dublin 1

Phone: +353 1 8720000

Website: <http://www.dublinbus.ie/home/>

Product Description:

Dublin Bus is the major public transport provider in the greater Dublin Area. It operates 950 Buses on 140 Bus Routes. It also provides Sightseeing Tours, Late Night Bus services etc. Dublin Bus has a new fleet of ultra modern accessible buses.

ENABLE IRELAND

National High Tech Assistive Training Service,
Unit 5, Block B,
Cashel Road Business Park,
Cashel Road,
Crumlin,
Dublin 12

Phone: 01-4992357

Email: slong@enableireland.i

CATA/DACA

Central Remedial Clinic
Vernon Avenue
Clontarf
Dublin 3

Phone: 01-8057560

Fax: 8335496

Email: www.crc.ie

EDEAN

Central Remedial Clinic
Vernon Avenue
Clontarf
Dublin 3

Phone: 01-8057560

Fax: 01-8335496

Email: bboyle@crc.ie

UNIQUE PROSPECTIVES

Ballyclovan Cottage
Ballyline
Callan
Co. Kilkenny

Phone: 056-25913

Fax: 056-25936

Email: brian@click2go.ie

Website: <http://www.click2go.ie/>

Product Description:

Manufacturer and supplier of Specialist Power wheelchair controls and computer joysticks. Also manufactures switch operated musical interface.

XML WORKSHOP LTD

10 Greenmount Industrial Estate
Harolds Cross
Dublin 12

Phone: 01-4547811

Fax: 01-4496299

Website: www.xmlw.ie

Email: ecampbell@xmlw.ie

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