

Research and Development Work Relating to Assistive Technology 2006-07

*Presented pursuant to section 22 of the
Chronically Sick and Disabled Persons Act 1970*



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DH Information Reader Box			
Policy HR/Workforce Management Planning Clinical	Estates Performance IM & T Finance Partnership working		
Document purpose:	For Information		
ROCR ref:		Gateway ref:	8423
Title:	Research and Development Work Relating to Assistive Technology 2006-07		
Author:	Research and Development Directorate, Department of Health		
Publication date:	July 2007		
Target audience:	Parliament		
Circulation list:			
Description:	The report covers research and development work carried out by or on behalf of any government department that might increase the range of activities and independence or well being of disabled people. The report describes the wide range of government funded projects supporting the development, introduction and evaluation of assistive technology.		
Cross ref:	Research and Development Work relating to Assistive Technology 2006-07		
Superseded docs:	N/A		
Action required:	N/A		
Timing:	N/A		
Contact details:	Research and Development Work Relating to Assistive Technology Department of Health Area 132, Richmond House 79 Whitehall London SW1A 2NS		
For recipient's use:			

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First published date

Published on the DH website, in electronic PDF format only. <http://www.dh.gov.uk/publications>

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Introduction

Report format and methodology

All the research featured in the report has been started, finished or is being carried out during the period April 2006 – March 2007 and is being funded by the Government or the European Union. The research covered in the report focuses on assistive technology which is defined as ‘any product or service designed to enable independence for disabled and older people’.

The report features projects that indicate the effectiveness of assistive technology in meeting the needs of a wide range of disabled and older people. These projects have been selected by the authors as illustrative of the potential benefits of investment in research and development into assistive technology.

This year’s report includes in Annex A a listing of all Government and European Union funded research into assistive technology started, finished or carried out during the year. The listing includes hyperlinks to further information on the Foundation for Assistive Technology (FAST) website, www.fastuk.org, including participant contact details, funding amounts and project progress. This information is freely available to the public, is regularly updated and provides the online format for this report. Further information on research and development in assistive technology funded by non-government organisations, on events, and service improvement activity can also be found on the FAST website.

The information provided in this report is gathered by desk research, including regular review of online information provided by research organisations, user representative and funding organisations, as well as information from sector journals, and information solicited directly from the research teams. The criteria for inclusion of projects in this report are published project aims or progress which includes a focus on assistive technology and that funding is through a Government source. FAST are grateful for the support of the research and development community in providing the information included in this report. While all attempts are made to ensure that the information provided is comprehensive, there may be projects which have not been identified and we would be grateful for notification of any such projects.

The policy context

Research and development activity funded by Government is shaped by the requirements of disabled people and the social and economic demands that are facing society. The policy context can provide one way by which to understand the shifting focus of research and development activity from one year to another.

There is growing recognition across Government departments of the potential of assistive technology to address the challenges set by an ageing population and to support social inclusion for a wide range of people with physical, sensory and cognitive impairments or learning disabilities. Encouragingly, this year’s report highlights initiatives to streamline the

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research process and to support researchers and their industrial partners to take prototypes through the development process and to bring products to market.

Enabling a disabled and aging population to maximise their independence

In November 2006 the Department of Health published "Our health, our care, our say: making it happen", an update on progress on implementation of the White Paper "Our health, our care, our say". The update report gives examples of progress at local level and gives a timetable of future developments including some large-scale integrated care and assistive technology pilots, such as the whole system long term conditions demonstrator programme. In December 2006 the Department of Health announced the award of funding to ten pilot projects to support independence for older people, in stage 2 of the Partnerships for Older People Projects (POPP) programme. These projects bring together a range of interventions, which have been chosen because of their combined potential to provide a sustainable shift of resources and culture towards prevention across the whole health and care system. In some cases interventions include falls prevention, handyperson services, equipment, adaptations and assistive technologies. The Department of Health is also funding eleven pilot projects on self-assessment by people with long-term conditions for home care and community equipment.

The Treasury has published a report on the long-term opportunities and challenges facing the UK, as background to the 2007 Comprehensive Spending Review. Key challenges include the demographic and socio-economic change associated with the high expectations for care of an aging population, alongside the rapid pace of innovation and technological diffusion, which will continue to transform the way people live and open up new possibilities for public services such as transport, education and health. A discussion paper, published in December 2006 from the Commission for Social Care Inspection, has emphasised that older people want real choices and the responsibility to choose the best possible lifestyle for them. The paper calls for robust - yet sensitive - approaches to dealing with risk in social care that take account of people's dignity, independence and well-being, alongside health and safety considerations.

The Prime Minister launched the Transforming Community Equipment and Wheelchair Services programme (TCEWS) in June last year. The work is being led by the Care Services Efficiency Delivery programme at the Department of Health. Its remit was to work collaboratively with stakeholders to develop a radical new model for delivery of community equipment and wheelchair services in England, which has users and carers at its heart. It was to look at how to make best use of the strengths of the third and independent sector and be supported by an outline business case and an indication of market appetite for change.

The intention was to look at the two services in parallel, but this has not been feasible. Further information on the next phase of development for the community equipment model is available at <http://www.csed.org.uk/>. The review has been completed. The outline business case for the new community equipment model was approved by the Minister for Care Services in April 2007 and work is currently underway to develop the model so that it can be put into operation in April 2008.

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With regard to wheelchair services, the programme was able to develop two potential models for wheelchair services in collaboration with users and their carers, seven wheelchair services, the wheelchair services managers, and to refine these potential models with practitioners and suppliers. Further data is required before recommendations can be made for the way forward. The Minister has approved a further data gathering exercise and asked the programme to report to him in autumn 2007. The programme will be working with wheelchair services to develop the new data gathering exercise.

The research featured in this report reflects how the demographic challenge of an ageing population is stimulating individual research projects and larger joint programmes of work. For example, five research councils are collaborating in The New Dynamics of Ageing, a seven year multidisciplinary research programme aimed at developing practical policy and implementation guidance and novel scientific, technological and design responses to help older people enjoy better quality lives.

Assistive technology supporting an inclusive society

As part of the Comprehensive Spending Review in 2007, the Treasury and Department for Education and Skills are jointly assessing the policy actions required to secure continued improvements in outcomes for children and young people, including those with disabilities. For disabled children, new technology can assist participation in society and for some it can also support a longer life span. This also represents a challenge for services – understanding when and how to support a population of disabled children with diverse needs. The Review is examining the role public services can play, working with disabled children and their families, to improve outcomes. It aims to identify key issues for policy and how existing good practice on meeting the needs of disabled children can be built upon.

The In Control project is pioneering the use of individual budgets for people with learning disabilities and other client groups in 80 local authorities. A report published in October on the first two years of pilot projects says that people felt much happier about their situations when they were in control and this approach did not cost more than traditional services.

A major review of policy on independent living for disabled people was announced in July 2006. The cross-Government Independent Living Review will identify the practical next steps needed to provide creative solutions to the many obstacles faced by disabled people that is likely to include the impact of assistive technology.

Streamlining the research process and supporting commercialisation

Sir David Cooksey reported in December 2006 on his review of the institutional arrangements for the new single fund for health research which was announced in the 2006 Budget. The review concludes that although good progress has been made in some areas, further work is needed to ensure that publicly funded health research is carried out in the most effective and

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efficient way, and to facilitate rapid translation of research findings into health and economic benefits.

In his Pre-Budget Report later in December, the Chancellor announced that he and the Secretaries of State for Health and the Department of Trade and Industry (DTI) had accepted Sir David's recommendations. The Government has established the Office for Strategic Coordination of Health Research to ensure a more strategically coherent approach across publicly-funded health research in the UK.

The new National Institute for Health Research (NIHR) was established, following the publication of the Government's health research strategy Best Research for Best Health. NIHR is making rapid progress as the main delivery mechanism for the strategy. The National Innovation Centre (NIC), part of the NHS Institute, announced in October that it is open for business offering support for innovators with a healthcare technology product in development, as well as guidance and direction on taking a product from an idea to the market. NHS Innovations London has received funding from the London Development Agency, to establish ATcare: a design and development centre for AT to provide the development, regulatory and business support and advice required by innovators, researchers and developers in universities, the NHS and industry to bring AT to market. FAST is a project partner and the findings of a pilot project are due to be reported in autumn 2007.

The Government and medical devices industry have published their final report Innovation for health: making a difference. The report sets out plans for acceleration of the use of medical innovation more widely across the NHS for the benefit of patients and gives a clearer idea of what the industry needs in order to grow and prosper. This is the culmination of the joint work set up by the Healthcare Industries Task Force (HITF) two years ago. Though this is a final report from HITF one of the recommendations is that a new mechanism is created for continuing the engagement between Government and the healthcare industry.

Controlling the e-environment

Over the past decade, computer technology has transformed most people's way of life. Booking holidays online, looking for information via Google or keeping in touch by email are now routine choices for many. Facilities such as online shopping and banking offer distinct advantages to older or disabled people who may have limited mobility, find it hard to use public transport or be reluctant to leave their home.

However the interfaces commonly used to access computers are sometimes inappropriate for older people or those with disabilities. Online forms may be confusing or difficult to follow for people with learning disabilities or the onset of dementia, while some options require too many keyboard strokes to be used easily by someone with complex motor problems.

A number of projects are looking at ways in which access to computers and other home automation devices can be made simpler and quicker and, in particular, at how people with severely limited physical movement can be supported by technology to use a computer to control their environment and be included in today's online world.

DIADEM – Delivering Inclusive Access for Disabled and Elderly Members of the community

To remain active and independent, older and disabled people frequently need to handle online transactions, yet may be prevented from doing so because many online systems are not accessible to them, especially if they have mild cognitive impairment. As more and more local and central government services go online, this problem is likely to become more acute and there is a greater risk of some groups within local communities becoming isolated because of their inability to handle online forms.

The goal of DIADEM, which is funded by the European Commission, is to provide an adaptable web browser interface that monitors the ability of the user to interact with the system and dynamically offers personalisation of the interface to optimise assistance to that specific user.



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This will be achieved by developing an expert system which will be located on the user's computer and will ensure that the many services available over the internet are open and accessible to as many people as possible, whilst providing privacy and security.

Brunel University is leading the project and field trials of the software will take place in Turin, Oslo and Sheffield. The software will be used in Turin and Sheffield to access services from the city councils. In Oslo the technology will be used in the workplace, enabling inclusive access for workers regardless of age or ability. Sheffield City Council will also look at issues relating to the practical use of the technology in public places. Work on this project started in late 2006 and is scheduled to finish in 2009.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

ART – Attention Responsive Technology

It has recently been estimated that over 3 million people in the European Union are so severely disabled that some form of eye-controlled communication and control system is required to give them independence. Currently there are a small number of commercial systems available for home automation, to help users with tasks such as opening and closing curtains, switching on the television or operating light switches. These typically offer the disabled individual a complex menu of operational controls which are selected using various tailored interface devices (such as a suck/blow tube).

ART aims to give severely disabled people the ability to operate and control electronic devices, including home automation systems, in their environments without the need for the help of a carer to operate such devices for them. A three year research project scheduled to end in mid 2007, the ART project is being funded through the PACCIT Programme (People At the Centre of Communication and IT), a joint initiative by the Engineering and Physical Sciences Research Council (EPSRC), the Economic and Social Research Council (ESRC) and the DTI. Work is being carried out at the Applied Vision Research Centre at Loughborough University.

With current systems, the user has to be seated in front of a computer screen and has to be able to work through a complicated series of choices, which can be hard for those with learning difficulties. ART replaces this concept with a more natural approach to interface selection. It also removes the need for the individual to be restricted by the interface with the computer monitor.



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All the individual has to do is to look directly at the device. The ART system will then recognise where they are looking and, if they are looking at a device, then the system's software automatically recognises which device they are looking at and offers the user a control interface specifically for that device, which the user can then decide to operate or not.

The key advantage of this technique is that it provides a more simplified user-interface than is otherwise possible and it does away with the traditional need for many-layered and complex menu interface systems. It also copes with the user simply looking at a device without an intention of operating it.

Two devices have been developed. One is a version where the eye movement recording cameras are head-mounted on the individual. The alternative option requires no attachments to the user, and could be mounted on a wheelchair, making it more user-friendly. These demonstrator prototypes show the potential for such devices, but more work is needed to create a commercial proposition. For instance, the ART system's current operational speed is around two seconds from the user looking at a device to being offered appropriate controls for that device. This is too long for acceptable long-term use by users. More needs to be done also to establish a robust, practical system with demonstrable potential for working autonomously in real world situations.

The project team are currently looking for further funding to develop these successful prototypes into commercial products and seeking partners with whom to collaborate to bring them onto the market.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

AABAC – Adaptive Asynchronous Brain Actuated Control

Control over environmental and computer interfaces can also be provided by Brain-Computer Interface (BCI) systems. These systems detect and analyse brain waves in order to understand a user's mental state and then translate that mental state into commands for communicating with and controlling computers, robots and other systems.

Previous research in this area has produced BCI systems which, while highly accurate, only recognised two mental states. Other disadvantages included low information transfer rates and unnatural user interfaces, which imposed severe limitations on BCI systems for real-world applications. AABAC is a joint project funded by the EPSRC with work being carried out at Essex University and Oxford University.

The Essex AABAC project team has recently developed a motor imagery based online BCI system, which extracts information from electroencephalogram (EEG) signals and analyses the features automatically in real-time in order to understand the mental tasks being performed by the user of the BCI system. Using this technology, a user has been able to control a simulated robot using motor imagery (that is by imagining hand and foot movements). This was

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demonstrated by asking the participant to control a 'robot', shown as a green solid circle on a screen, to reach a target position represented by a red square.

Over the three years from April 2006, the AABAC team will be working to create an adaptive online BCI system for brain-actuated control of robots or wheelchairs. Such systems will make use of the advantages of asynchronous computer protocols, which allow for a high information transfer rate and natural operation mode, and will also benefit from adaptive learning so as to improve the system's accuracy and robustness.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Supporting people with communication impairments

Computer technology has made an important contribution to the lives of people with a range of communication impairments. Speech synthesisers can read the contents of a computer screen to someone with vision impairment, for instance, or can be embedded in sophisticated communication aids which offer a way for people with speech impairment to make their views and preferences known.

An investigation into the impact of a communication resource pack on mechanically ventilated patients, visitors and staff on an intensive care unit

Augmented alternative communication (AAC) devices are typically used by children and adults who cannot speak, perhaps because of disability or as a result of an illness such as cancer or a stroke. To use such equipment successfully takes a substantial amount of time and effort on the part of both the user and the therapists who are assisting them, since such devices frequently require people to build up a vocabulary piece by piece and to learn a different approach to putting sentences together.

Some people who could benefit from some kind of communication aid, such as people who have suffered a medical emergency which requires hospitalisation, may not have time or energy to learn to use these devices. Patients on an intensive care unit who are mechanically ventilated have extreme difficulty communicating with visitors or staff. This inability to make themselves understood can impact on their treatment and recovery and can be highly distressing for relatives.

A six-month project at the National Hospital for Neurology and Neurosurgery in 2006 investigated whether a low-tech communication resource pack could improve the communication experiences of mechanically ventilated patients whilst on intensive care units. The resource pack included tailored advice sheets, writing materials and general picture board relating to care with conversational phrases/questions, an emotions board, rating scales, a pain scale and communication options. The project team compared the experiences of people using the resource pack with the perceptions of members of staff and visitors. Participants were interviewed twice: once before they had access to the resource pack and once afterwards.

Results confirmed existing research regarding the communication difficulties experienced by people in this situation and indicated that the communication resource pack did not dramatically influence the individual's perceptions of these communication difficulties or lessen the psychological impact of not being able to speak. However, visitors and nurses found the pack useful for communication.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Automatically-determined unit inventories for unit selection text-to-speech synthesis

Speech synthesis (the generation of speech by computer) is a key technology for mobile computing, telephone-based services and some forms of assistive technology. A recent development, called 'unit selection speech synthesis' has now improved the quality of the speech so much that it is often indistinguishable from natural speech.

Unfortunately the creation of new voices for this unit selection technology is currently expensive because it is labour intensive and must be done by experts. This is preventing the use of the technology in many applications, such as the production of high quality speech synthesisers for languages spoken in less developed countries.

A three year project started mid-2006 at the Centre for Speech Technology Research at the University of Edinburgh, funded by EPSRC, aims to develop methods which will make it quicker and cheaper to create new voices for speech synthesisers and which will allow non-experts to carry out this work.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Facilitating language play in non-speaking children through computer supported joke construction

There is evidence that language play, including using puns and other jokes, has a beneficial effect on a child's developing language and communication skills. Children with communication impairments are often reliant on augmented communication aids in order to carry on conversations, but these aids give little scope for generating novel language. This inhibits experimentation with language and limits the trying out of humorous ideas, which can in turn have a stultifying effect on the child's language development.

A collaborative project between the School of Computing at Dundee University, the School of Informatics at Edinburgh University and the Department of Computing Science at Aberdeen University, with funding from the EPSRC, has developed pun generating software called STANDUP. It was designed for and evaluated with children with complex communication needs. The project began in October 2003 and ran until March 2007.



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The results showed that when children used the STANDUP software, their language development skills started to mirror the patterns of behaviour of typical children. For example, some children regularly opted to tell the punch line of a joke first, or to repeat a joke which only they found funny, both of which are common traits of all children when they are experimenting with language.

Unlike other communication aids, where jokes are pre-stored, STANDUP allowed the children to explore options independently to create their own puns or riddles which helped the development of their language skills and self-esteem.



The STANDUP software is now commercially available free of charge and can be downloaded from <http://www.csd.abdn.ac.uk/research/standup>. Further research work is being considered to improve the interface design and to explore STANDUP's impact on interactive conversation, joke comprehension and vocabulary acquisition.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Mainstreaming telecare

The use of telecare to support both informal and formal care mechanisms and to maintain older people's quality of life in their own homes is now central to emerging government policy on caring for older people. Community alarm systems (first generation telecare) have been around for 40 years and are in the homes of 1.6 million users in the UK. Second generation telecare has recently been introduced and is being provided to many of those people who have first generation systems.

The aim of these telecare systems is early detection of factors likely to lead to a requirement for institutional care and timely intervention to prevent loss of independence.

Supporting Independence: New Products, New Practices, New Communities

This is a three year EPSRC-funded project, which finished at the end of March 2007 and involves researchers at Barnsley Hospital, Imperial College London, University College London and Dundee University, as well as representatives from the charity sector including Age Concern, Anchor Trust and the Thomas Pocklington Trust and commercial partners including the Tunstall Group.

Working with housing and care providers, the team is evaluating the deployment of a variety of telecare technologies in three contrasting housing settings: a large-scale care village, an extra-care facility and the mainstream private sector housing stock. Information from user-centred studies focusing on housing, health and social care needs is being used to help inform the type of telecare interventions that are made. In parallel to the user-centred research, the team is exploring the impact of the interventions on the organisational processes of care delivery, drawing conclusions on the potential system-wide impact of telecare.

The aim of the project is to evaluate packages of telecare technology in terms of their potential role in promoting independence, the ease with which they can be deployed and the extent to which they can be applied to differing housing settings. The project has also sought to develop service and business models that integrate telecare with mainstream care delivery processes and evolving formal and informal care delivery practices. In addition, researchers are striving to develop improved evaluation tools and techniques for predicting what users need and matching their requirements to available and emerging technologies. Overall, the aim of the project is to indicate the implications of introducing telecare solutions on a whole system basis.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

AT4I – Assistive Technology for Independence

A two year telecare project, AT4I (Assistive Technology for Independence), that ended in March 2006, also assessed the impact of introducing technology to improve older people's independence, social inclusion and health by looking at what happened when the Tunstall Group installed a variety of assistive technologies in a sheltered housing scheme in Doncaster.

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The scheme has 40 self contained dwellings and residents were offered their choice of four different packages of help. Those options were:

- The 'lifestyle reassurance package' consisting of bed and chair occupancy sensors, passive infra-red movement detectors and door and electrical usage sensors.
- The 'security package' consisting of a front door CCTV community television network, intruder alarm, flood detectors and extreme heat sensors.
- The 'falls package' consisting of fall detectors and an automatic light switch
- The 'specialist devices' package which offered more specialist items such as a wandering client system, epilepsy bed sensor, strobe light alert or vibrating pillow alert.



In addition, after consultation with the residents, the laundry facilities were moved and the space used to create an Internet café consisting of three computers. With funding from the Neighbourhood Renewal Unit, researchers from the Department of Medical Physics and Clinical Engineering at Barnsley Hospital NHS Foundation Trust sought the views of residents within the intervention group and those in a control group to find out what effect such developments were having.

Using questionnaires at baseline, six and twelve month periods the researchers found that 75% of the intervention group felt this technology helped them stay living at home, 58% believed it helped to prevent them going into hospital, 79% felt it gave peace of mind to family members and 92% did not consider it intrusive. In terms of the Internet café, at the end of the evaluation period 25% of participants were using the computers for a minimum of 20 minutes per week.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Telehealth supporting people with long-term conditions

People with a chronic illness, such as diabetes or lung disease, frequently have to attend a large number of medical appointments at their GP or hospital clinics. Such appointments may be difficult for older or disabled patients to get to because of problems with transport, and may take up a lot of time in the day. In addition, patients who miss regular check-ups or whose condition deteriorates suddenly may require urgent medical treatment.

Monitoring chronically ill patients as they go about their normal activity via special sensors and computer networks allows for early release from hospitals and improves the patient's quality of life. Analysis of the information collected via monitoring can be used to predict potential problems such as a possible heart attack for a specific patient being monitored and to generate a warning to the patient or medical staff. The information can also be used by medical researchers to understand the physiological changes within the body that take place prior to an acute problem, such as a heart attack.

Supporting independence

As part of the Supporting Independence initiative, Barnsley Hospital is running trials of an innovative telecare service aimed at supporting people with chronic heart failure (CHF). In industrialised countries such as the UK this condition affects 1% of the overall population rising to 10% at 70 years of age. CHF accounts for 5% of all medical admissions to hospital, costing an estimated £360 million to the NHS. The project team proposed that telecare offers a way to provide an earlier diagnosis, and with more appropriate and timely use of drugs, that it could increase patient survival and quality of life.

In a pilot trial which ended in April 2007, forty CHF patients used Docobo's "doc@home" remote monitoring telehealth system. The participants were asked to answer a range of health and quality of life questions on the hand-held device and this feedback was supplemented with medical information such as blood pressure and weight on a daily basis. Analysis of this data was performed automatically by the system and made available on a website which could be reviewed by the CHF team.

Where issues of concern were apparent, patients were telephoned, given advice and changes to medication were made when required. If the telephone intervention was not successful, then a member of the CHF team visited the patient in their home. In addition to the physiological monitoring system, lifestyle reassurance equipment was installed in a subset of homes to investigate links between changing health data and behaviour/motion patterns.

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The research team are currently analysing their findings for their final report and intend to use the knowledge gained to examine how such systems can be mainstreamed into service delivery throughout the country.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

AMUSE – Autonomic Management of Ubiquitous e-Health Systems

On-body or environmental sensors can be used in the home for monitoring older people and help determine problem situations or deterioration of well-being over time. However, configuring the multiple sensors and software components that are used in an adaptive body-area network or a home monitoring network is not currently feasible for patients or medical staff who are not technically adept.

The AMUSE project, funded by EPSRC and based at Imperial College London, is developing self-configuring and self-managing (autonomic) systems. The systems must be able to add or remove components, cater for failed components and error prone sensors, automatically detect and adapt to a users' range of activities and communication capability, as well as catering for interaction with health visitors or medical staff who attend patients or visit older people.

The project is developing and trialling the Self-Managed Cell (SMC) concept; an SMC manages a set of components such as those in a body-area network, in a room or even in a distributed application. The components could be on-body sensor nodes or, in the future, 'intelligent' implantable sensors or even smart phones and PDAs. Work on this project began in early 2004 and is scheduled to finish in 2007.

The team is currently building a prototype system which consists of a set of body sensor nodes with wireless capability that can communicate by low-power radio with a PDA that hosts the management components and has wireless local area network (LAN) or mobile phone-style communications. Related projects are starting that will investigate the privacy, trust and security issues raised by such work; the potential for using micro-miniaturised and implantable sensors; and examine how to define, gather and combine the information that is supplied by multiple sensors, make sense of this information and define policies for the actions that should be taken in response to specific sensor readings.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Lifestyle monitoring for independence

Healthcare providers are coming under increasing pressure to improve the quality of care delivered to patients through effective prevention and post-operative care. At the same time, there is an emphasis on the need to curtail the growth in healthcare spending which has been fuelled by the demands of an ageing population and the increase in instances of chronic diseases.

Sensor-based measurements provide site-specific information from the body and can track dynamic and quantitative differences between readings from both the vascular system and the body's tissues. Miniaturised wireless biosensors have the potential to change the way in which clinicians monitor the progression of diseases, assess post-operative care and track the body's reaction to complex therapeutic regimes.

BiosensorNet: Autonomic Biosensor Networks for Pervasive Healthcare

One project in this area is BiosensorNet, which is taking place at Imperial College London and is funded by EPSRC. This work aims to investigate how intelligent miniaturised biosensors will allow the monitoring of patients as they maintain their normal daily activities, and provide warnings when critical events arise. These sensors will combine information from multiple sources such as electrocardiogram (ECG) readings, blood oxygenation level, temperature and the current physical activity of the patient and report this data to a remote monitoring service.

The demonstrator will be based on monitoring patients in a hospital who have had major surgery and will examine the often complex technical issues involved. Some of the sensors may potentially be implanted, but even for on-body sensors it is not practical to change batteries frequently so technology employing low power for both signal processing and wireless communication will be required.

This project started in late 2005 and will run until October 2008. It involves a multi-disciplinary consortium combining computer scientists, electronic engineers, bio-engineers and medical researchers and industrial partners.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

CAALYX – Complete Ambient Assisted Living eXperiment

Older people and those with chronic health problems often want to remain in their own homes, rather than move into residential care. However, keeping safe and monitoring potential changes in health can be difficult and may involve the person either visiting hospitals and clinics frequently or receiving regular visits from caregivers. Both these options can be expensive and time consuming, so alternative approaches are required.

Ambient Assisted Living (AAL) is a concept which aims to prolong the time people can live independently, through the use of intelligent, highly personalised networked embedded objects

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and systems. The network constantly monitors output information from the person and highlights any changes which could be indicative of problems developing.

The CAALYX project began in January 2007 and is a two-year project funded by the European Commission under the Sixth Framework Programme (FP6). It has a total of eight participant organisations based in Spain, Portugal, Germany, Italy, UK and Ireland. The University of Plymouth is responsible for the dissemination and exploitation of the outcomes from the project.

The main objective is to develop, and test through user participation, a wearable light mobile device able to measure specific vital signs in older or ill people. This device will detect falls and accidents and will be able to communicate autonomously in real time with the person's caregiver or with the emergency services. The emergency information will include the geographic position and health information about the person concerned. The project will use largely non-intrusive new sensors for fall detection and these, coupled with highly sensitive geo-positioning, will address many concerns older people often have about adopting this kind of technology.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Rehabilitation

People who have suffered a critical illness, such as a stroke or heart attack, or who are involved in a serious accident which affects their mobility or their speech, frequently require intensive rehabilitation if they are to re-learn everyday skills such as talking or walking. Traditionally this is delivered by a therapist either in hospital or at home. However, some patients may not have access to sufficient therapy sessions to increase their chances of making good progress.

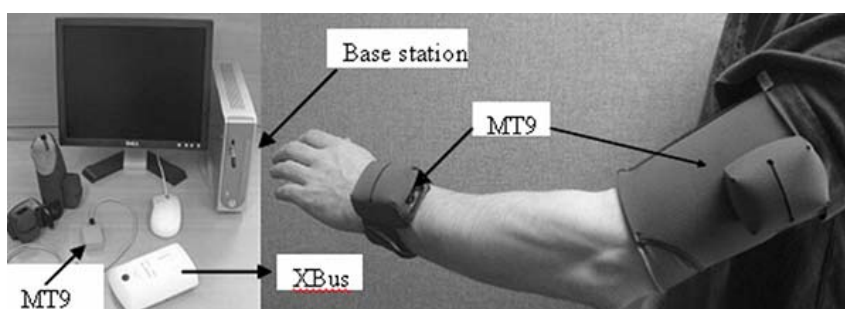
An alternative approach is to try and find ways of offering rehabilitation therapy that do not necessarily require the presence of a trained therapist. Patients may be encouraged to follow an online or video therapy session, which replicates what the therapist has told them to do but which gives them more hours of therapy each week than would otherwise be available.

SMART rehabilitation: technological applications for use in the home

Stroke is the biggest single cause of severe disability in the UK, with over 100,000 new episodes in England and Wales each year. Organised stroke care improves outcomes but there are significant differences in the availability of such services. In some areas, rehabilitation may be targeted mainly at discharge from hospital with little monitoring following a patient's return home. Yet active rehabilitation to improve mobility following a stroke is a key factor in helping people to remain at home, in reducing the likelihood of falls and limiting the need for admission to long-term care.

Researchers from Sheffield Hallam University, University of Bath, University of Essex, University of Ulster and the Stroke Association investigated the development of SMART monitoring systems for hospital or home-based rehabilitation in a three-year project which concluded at the end of 2006. The aim of the project, which was funded by the EPSRC's EQUAL (Extend Quality Life) initiative, was to explore how advanced sensor technology could be used to increase the amount of rehabilitation a person undertakes.

The SMART project utilised orientation sensors of the kind which are often used in sport. The devices were attached to the wrist and upper arm using clothing resembling sports wear. When the user undertakes arm movements prescribed by a trained therapist, the sensors are able to track this movement. Each movement was then recorded and displayed on a computer or TV screen.



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This information is used to provide feedback to the user about their progress and can also be accessed remotely by the therapist who prescribed the rehabilitative interventions, who may be based at a local hospital or primary care setting.

At the start of the project, researchers held focus groups to identify the issues that are important to users so they could be built into the development and testing of any devices. Subsequent user focus groups assessed the screen interface as well as trying on the various attachment methods for the movement sensors. The findings of this research underline the need for technological devices which are compact, simple to operate and usable by stroke patients without the help of a carer. The system also needs to give encouraging feedback to patients about outcomes even when progress was slow.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Rehabilitation services for people with dementia

People with dementia can suffer accidents and falls, and then require frequent hospital admissions and may spend longer than is necessary in hospital because they cannot manage in their home without support. A mixture of occupational therapy, physical therapy and specialist equipment, plus help with personal care, has been found to maximise independence for people with dementia and reduce hospital admissions.

A variety of intermediate care solutions are being adopted around the country, all designed to maintain people with dementia in their own home or to facilitate their return to their home from hospital or residential care. These intermediate support services can have an important role in identifying potential health and social care problems before the patient hits a crisis.

Researchers in the Faculty of Health and Social Care at the University of the West of England worked with Dementia Voice on a three year project funded by the Department of Health to investigate how such support services work in practice. The project finished in mid-2006.

The aims of this study were to: identify the range of specialist rehabilitation services for older people with dementia in England; explore how general rehabilitation services meet the needs of older people with dementia; establish inclusion and exclusion criteria to rehabilitation services in relation to the existence of dementia; illustrate specialist models of successful approach to rehabilitation for this user group; gain feedback on rehabilitation services from older people with dementia and their carers; and develop guidance and recommendations for planners, commissioners and providers seeking to establish intermediate specialist mental health services for people with dementia.

The project produced a Service Development Checklist to highlight a range of issues that might be considered when developing rehabilitation services for people with dementia.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

THRIVE – TelereHAbilitation through Interactive Video Endorsement study

People with spinal cord injury are usually treated in specialist Spinal Treatment centres, of which there are 12 in the UK. After discharge, they are followed up for life by these centres. As each centre has a large catchment area this can mean substantial amounts of travelling for staff visiting patients at home and for patients attending outpatient clinics. The growing number of patients with spinal cord injury is putting pressure on follow up services, especially as patients tend to live longer and experience complicated clinical issues.

THRIVE is a European Commission project under the 5th framework (Quality of Life) initiative which ran from July 2003 to October 2006. Its aim was to determine the technical feasibility and the clinical impact of regular video-link sessions where spinal patients receive advice at home from specialists at the spinal unit for the first six months from discharge.

Spinal Treatment Centres in Italy, Belgium and the UK undertook a randomised controlled trial with 113 adults admitted to the centres for the first time who had non progressive spinal cord injury between areas on the spinal cord (C4 and L2). Of these patients, 56 came from the UK. Before discharge all were assessed for physical and psychological function, quality of life and neurological status. They were then randomly allocated to either the control or the trial group. The trial group had broadband, a dedicated system was installed and the group were offered regular telemedicine sessions with specialist staff. Topics discussed in these sessions included nursing and medical concerns, such as medication, pain and pressure sores, as well as therapy and rehabilitation issues, such as the provision of appropriate assistive technology and advice and encouragement on using standing frames. All participants retained the usual follow up services (including telephone contacts, home visits, out-patient clinics) and all were visited by the researcher at two and six months post discharge to record health events and assess quality of life.

Results showed that all were positive about the potential for telemedicine--regular contact with an expert was identified as important. Other advantages of telemedicine were that pictures of skin marks or possible pressure sores could be shown via video (something which would not be possible in a telephone follow-up), and that clinicians could demonstrate ways of using equipment.

The project identified potential future areas of research where web-based telemedicine could be used when providing care. This could include supporting the family prior to a patient's admission to the Centre, supporting non-specialist referring hospitals, as well as monitoring pressure sores and providing psychological help to patients at the time it would be most needed. Another possibility proposed was to teach spinal cord injury best practice to hospitals abroad.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

ParkService

People with Parkinson's disease (PD) often have problems when walking, even in conditions which would not normally be viewed as challenging, because their perceptual difficulties mean they can have a tendency to 'freeze' unexpectedly, or to adopt a shuffling gait. A previous project, called PARREHA (Rehabilitation IT Aid for Parkinson's Disease), developed a prototype set of glasses using virtual reality techniques which encouraged better walking patterns in people with PD by providing visual clues.

The problems with mobility which are characteristic of PD can have a severe effect on people's physical and emotional health, leading to social exclusion. The ParkService project used funding from the European eTen programme to develop a prototype telematics service linking the person with PD at home and a clinician. The project finished in March 2007 and the service, which is being developed into a commercial offering by Oxford Computer Consultants, will offer generalised support through an online connection from the home, as well as reminders to take medication and monitoring of daily conditions.

This should help clinicians gain a better understanding of how PD is affecting a particular patient, provide information about the effectiveness of interventions such as the virtual reality glasses, and should also help reduce social exclusion for people with PD. The objective is to use feedback from pilots to validate the prototype service with all user groups and to refine and localise the service across different European Union states.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Designing smart environments

There is a great deal to be done to make the design of household items, homes and offices more accessible to all the community and not just the young and the fit. Many older or disabled people find that houses contain too many barriers to independent living—such as steep stairs or difficult to turn taps—while many designers seem unaware of the often simple changes to equipment and building design which would make life easier for everyone. However, many older people cannot define what their needs are and can find it difficult to articulate what they want.

Three projects outlined below have been funded by the EPSRC and the Biotechnology and Biological Sciences Research Council (BBSRC) through the Strategic Promotion of Ageing Research Capacity (SPARC) programme.

Design and the Home

The Design and the Home project, based at the Art and Design Research Centre at Sheffield Hallam University, will design and construct a physical living room environment which can be used as a laboratory for testing prototype assistive technology. The study, which commenced in autumn 2006 and is due to finish in 2009, aims to define the problems and barriers associated with maintaining independence, quality of life and care at home in later life.

Some issues which users may not be able to articulate verbally could be recognised through the use of prototypes and new knowledge and may be established through 'doing' rather than 'saying'. User requirements for future products may emerge out of their direct experience of using prototypes. The research team will be moving into a new building next year that will incorporate a brand new 'user lab' and this project is informing the nature of the facility required.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Inclusive engineering approach: enhanced data gathering for an optimum diameter for ease of opening

Many older people find opening everyday packaging a challenge because of a decline in strength and dexterity. This restricts their choice as consumers and in some cases may compromise their nutrition and general health since they may not be able to open some food containers or jars.

A project team from the Department of Mechanical Engineering at Sheffield University has already developed a realistic test jam jar consisting of a glass container with a metal closure and robust measurement equipment inside. This can be used with groups of older users to collect data on the optimum packaging for ease of use.

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Further development work during a six month project in 2006 is due to report findings shortly. This work aimed to make the jam jar more portable and capable of giving the extensive data required by food manufacturers if they are to be persuaded to provide packaging which is safely accessible to people of all abilities.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Multimodal augmented reality to support ageing in place: a pilot study

Researchers at Lincoln University are working to improve the information delivered by household devices, such as medication and nutrition reminders, to enable older people to make healthy and safe lifestyle choices and to maximise their independence at home

Over a twelve month period in 2006 this study recruited a group of older people living at home and asked for their views on prototypes of common household objects like microwaves or clocks which had additional visual 'clues' to safe behaviour on the interface.

The aim is to create persuasive, motivational, appropriate information cues to aid ageing-in-place by providing help both with longer term lifestyle choices and with short term warnings. This project has just finished and results are due to be reported shortly.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Remodelling sheltered housing and residential care homes to extra care housing

A key objective of policy for older people is to enable them to remain in a home of their own. For the majority this will mean in their existing home but for a minority the most suitable option will be extra care housing (sheltered housing with extra facilities such as additional communal space, meals and the availability of care). Research shows that this is popular with older people and is a cost effective option.

However, building new schemes is expensive and takes a long time therefore some providers are converting existing sheltered housing schemes and residential care homes into extra care housing. No research has been done on the technical issues involved in this process, how they were overcome, the benefits and outcomes.

These factors are now being considered in a two year project examining the remodelling of sheltered housing and residential care homes to extra care housing between 2005 and 2007 being undertaken by King's College London and University College London with funding from the EPSRC. This is looking at five case studies of local authorities and five case studies of housing associations. The research includes studying before and after drawings, holding interviews with staff, residents and architects, examining the assistive technology needed and assessing the costs of conversions.

Early findings show some problems including constraints on sites, the need to decant residents while building work is going on, and wide differences in the provision of care and meals. Some

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residents are very frail and the project raises questions about the suitability for them of conversion of existing homes.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Project AWE – Access to the Working Environment

Many disabled people are discriminated against when seeking employment simply because they cannot physically access the workplace, a problem which is being addressed in a project underway at Salford University Research Focus on Accessible Environments (SURFACE) and which is funded by the European Social Fund.

Over the past three years researchers have worked to identify the disabling barriers to work that are created by the built environment, focusing on inclusive design for a diverse population. The aim is to offer support to employers by proposing design solutions to avoid the creation of disabling barriers, or if already present, on ways to remove them. This may include automatically opening doors, induction loops in reception, meeting rooms and workstations. Or it may be improvements that can be made to lighting, signage or tactile surfaces.

Researchers have interviewed disabled people about workplace environments, along with agencies that support disabled people into work, and have also sought the views of employers. The project ended in autumn 2006 and researchers are currently preparing a major report on its findings which will be disseminated to policy makers, legislators, employers and disabled people.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Safe and enjoyable travel

As well as using technology to help people stay safe at home and to access the office environment, researchers are also looking at the different ways in which technology can be used to help older and disabled people travel in greater safety.

DAISY – Dynamic Assistive Information System

This project, funded by the DTI and EPSRC, builds on an earlier feasibility project called DIMPLE also carried out by the Accessibility Group at University College, London. Its aim is to enhance the independence of people with learning difficulties who require pre-and in-trip information about pedestrian and public transport journeys by 'industrialising' the DIMPLE software to provide an easy to use navigation tool based on an ordinary mobile phone.

The DAISY project, which ran between March 2003 and August 2006, has developed a way of combining a Global Positioning System (GPS) with the use of images to provide a very accurate but simple positioning system which is then coupled to advice (via voice or text) to the user about where to go next. This is encapsulated in a mobile phone. The system proved easy to master and people with learning difficulties were pleased with the trial version of the system when they tested it.



The system's precision and the fact it can be used without GPS mean that it could also be used for route guidance within buildings (e.g. between departments and out-patient facilities in a hospital) and for learning routes in advance via a computer.

The current system is about to be upgraded to work on more mobile phone models and to make the software more robust. Transport for London has expressed an interest in DAISY and has provided £25,000 towards upgrading and testing the system during the Tour de France cycling event in London in July 2007.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Investigation into the advanced technology desires, needs and requirements for older drivers

The older driver is an increasingly common phenomenon. Thirty years ago only 15% of people over 70 held a driving licence, while the latest figures estimate this has risen to 51%. Other demographic changes, such as the fact people are living longer, have a more active retirement

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and are more likely to need to drive to visit family or to go shopping all mean that individuals are continuing to drive for longer and that older drivers are driving more than they used to.

Older drivers often experience difficulty in using the advanced technologies that are provided to car drivers, yet such technology can offer them a way to continue to drive and to maintain their independence. EPSRC and the BBSRC through the SPARC programme are funding a project at Middlesex University to identify older drivers' requirements and to influence the development of specifications for new vehicles and user interfaces to make them older driver friendly.

Building on evidence that new technology has been found to be more user friendly if users are involved in the development process from the outset, the project has asked a group of older drivers to participate in this project to investigate technologies and to assess the barriers to adoption. The older drivers were asked about their experience of using a vehicle that provides advanced technologies unfamiliar to many motorists. Examples of the sorts of technologies to be considered include: lane departure warnings, night vision enhancement, alternative input devices and navigation aids.

The project, which started in late 2005 and finished in April 2007, aimed to develop design solutions and guidelines for designing complex user interfaces for older drivers. The team also developed prototype devices to validate the methodology used in the project and to elicit further older users' requirements.

Researchers have conducted a survey of more than 230 people, and followed this up with focus groups and individual telephone interviews. All the drivers who were surveyed were aged 50+, and nearly two thirds used their car daily. Half the younger drivers (50-59), but only 13% of the oldest drivers (70-79 and 80+), drove over 10,000 miles per year. The project team are beginning to share their results with industry and academia as part of efforts to influence car design practice.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

LBS4all – Location based services for people with mobility problems

This project was based at the City University, London, and aimed to provide navigational help for people who have difficulty getting around and who need to know the most accessible routes. Other project partners came from the Human Computer Interaction Group at York University and the Institute of Gerontology at King's College London University. The project was funded by the EPSRC and the DTI under the PACCIT initiative.

Technological developments in mobile telephony and geographic information systems are making it possible to locate the geographic position not only of vehicles and boats, but also of people on foot. By combining the sophisticated technology associated with Geographic Information Systems (GIS), Global Positioning Systems (GPS) and Location Based Services (LBS) it is possible to address the pedestrian navigational needs of two groups of people who

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are frequently excluded from commercial design concerns: older people and people with severe visual impairments.

Following 30 initial interviews with a sample of older people about their activities and needs as pedestrians, a navigation device was developed and tried out in three separate trials over a two year period with a small sample of men and women, with an age range of 73-88 years. The device combines the information available from maps and guidebooks with information about the user's geographic location. After each trial, participants were interviewed in detail about their experience and modifications made to the device on the basis of their suggestion, for example, providing a simpler interface and a different style of map.



An important finding from the research is that these older people were in no way 'technology averse'. They were extremely interested in the innovation, but expressed clearly the importance of simple, clear and reliable operation and were greatly appreciative of being helped to use the new device in the first instance.

Research also suggested that the device might have much to offer the older population in general and not just those with disabilities. Younger older people (up to age 75), who may be enjoying better health and higher incomes than in the past, are likely to move around more and so a pocket navigation device may appeal to many as an easy to take with you, electronic guide and map.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

PAMELA – Pedestrian Accessibility and Movement Environment Laboratory

PAMELA is a large (80 square metres) laboratory facility which has been designed and developed by the Accessibility Research Group at University College London to provide controlled conditions in which interactions between pedestrians and the pedestrian environment can be studied.

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The physical environment in the laboratory area is computer-controlled to provide precise changes in surface profile (steps, slopes etc) and lateral and horizontal gaps. The surface material can also be changed. This enables researchers to represent a wide range of pedestrian facilities - stations, pedestrian footways, streets, shopping malls, and so on. The laboratory also has a sophisticated lighting system which enables researchers to light the platform with a range of different street lighting, all under computer control.

The facility is equipped with a sound system which is capable of producing both ambient noise (e.g. birdsong, traffic noise, general noise in a railway station, playground etc) and localised noise (e.g. a train in a station, announcements, street sounds such as warnings and noises from shops or stationary vehicles). The system can also provide dynamic noises; trains pulling in, departing from or passing through a station, traffic or people moving around, aircraft at different heights moving past the observer.



© UCL Accessibility Research Group

With physical and sensory systems all controllable, researchers can examine the impact of a single component within the overall conditions. The laboratory is equipped with a large range of data collection equipment, including laser scanners, video cameras, eye tracking cameras, heart rate monitors, vision and eye testing equipment.

The development of PAMELA was funded by EPSRC from 2006 to 2007 and by February 2007, the facility has been designed, constructed and commissioned. Some of the experiments were presented at the BA Festival of Science in September 2006. A number of experiments are currently being run in the laboratory, including investigation into new ways of evaluating accessibility, the capacity of pedestrian environments, obstacle avoidance under different lighting conditions, capabilities of people with low vision, wheelchair design and testing of remedial treatments for Parkinson's disease.

PAMELA offers opportunities for research into many aspects of how a person interacts with their physical, sensory and cognitive environment. This has attracted interest from all over the world, with active research being conducted in the laboratory by researchers from Italy and more being planned with researchers in the USA. The laboratory has attracted interest from the Institute of Orthopaedics, Institute of Ophthalmology, the Ear Institute, the Institute of Neurology, Cognitive Neuroscience, local authorities and central government.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Technologies for vision impaired students

Blind and visually impaired people have always had problems accessing graphical information such as maps or mathematical graphs and this causes obvious difficulties when they need to be able to access data held in a variety of graphical formats as part of their education or when at work. Several projects in the UK and across Europe have been looking at alternative methods for describing visual elements, using other senses such as touch and hearing.

Investigation of the use of tactile displays for visualisation for blind people

Common methods of making data accessible to the sight-impaired all have their drawbacks when it comes to providing access to visualisations such as graphs, tables and bar charts. Audio representations do not provide an overview of the data displayed, while force feedback devices, which can provide a compelling illusion of contact with virtual environments, have proved to be prohibitively expensive.

Tactile displays are actuators which seek to display information via mechanical stimulation of the skin such as indentation or vibration cues. Such technology is now widely used in, for example, mobile phone alerts, and an EPSRC-funded research team at Glasgow University has been investigating whether this offers a cheaper, more portable, alternative method for blind people to read graphical data. The project, which began in 2004 and finished at the end of 2006, included a group of blind and visually impaired students in the UK in further education to assess the options. Researchers developed a prototype tactile visualisation system, which used a stylus, and graphics tablet as an input device. Participants controlled these with their dominant hand, while a tactile representation of the area of the screen underneath the pointer was perceived on their non-dominant hand, which was resting on a mouse-based device that incorporates two tactile arrays. Speech feedback was also used to augment the information.

The prototype is now being developed further and will be compared with current interfaces for navigating audio representations of data series to formally verify any increase in speed and accuracy. Researchers also plan to investigate how the interface works with less structured forms of graphs (it was initially tested only on bar charts) and whether it can support collaboration and communication between visually impaired people and sighted colleagues working on a shared graphic representation.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

LAMBDA – Linear Access to Mathematics for Braille Device and Audio-synthesis

Researchers across Europe have been collaborating on Lambda; a project funded under the European Commission IST programme, which includes contributions from the Human Computer Interaction Research Group at York University and the Royal National College for the Blind (RNC), Hereford. Their aim is to solve the problem of mathematics text management,

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such as formulae, by blind students in secondary schools and universities, as well as that of disseminating science texts, in digital formats and through Braille print.

Since its inception in September 2002, the project has developed an easily convertible computer code which will translate maths expressions linearly so that they can be read, written, manipulated and computed using special Braille devices and/or via speech synthesis. At its conclusion at the end of 2006, several prototypes were being tested and researchers are currently seeking commercialisation possibilities.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Our place in an unseen universe

People with vision impairments are also at a disadvantage when trying to find out about new developments in areas such as science. The Particle Physics and Astronomy Research Council (PPARC) funded a six-month project in 2006 called 'Our place in an unseen universe'. The Royal National Institute for the Blind (RNIB) led a team, which developed and produced a series of overlays on astronomy and space exploration using the T3 Talking Tactile Technology.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Performance of hearing technology

People who have impaired hearing or who need to use hearing aids frequently feel excluded from mainstream activities, as they can find it especially hard to follow sounds in situations where there is a lot of background noise or echo.

Model based approach towards practical enhancement of audio signals acquired in real acoustic environments

Digital audio is now widely available in broadcasting, storage and multimedia applications, all of which offer crystal clear sound quality. This development has heightened expectations for the performance of all audio signals—digital hearing aids should outperform their analogue counterparts in concert halls where every note matters, for instance, and speech recognition software should achieve high recognition rates in noisy office environments. However, the quality and intelligibility of speech in such scenarios is constrained not just by the reproduction quality of the hardware itself. More importantly, it is dependent on the acoustical properties of the particular environment. In particular, audio signals in confined acoustic environments exhibit reverberation, which causes problems for two major types of signal processing applications.

The first is automatic speech recognition, where it is more difficult to identify reverberant speech rather than ordinary speech. This means it is not possible to use hands-free equipment in such situations unless the speaker has the microphone very close to their mouth, something which a disabled person may find hard to achieve. The second involves the desire to improve speech quality and intelligibility from devices such as mobile and hands-free telephones and next generation digital hearing aids.

Researchers at the School of Engineering and Electronics at the University of Edinburgh began work in April 2006 on a two-year project funded by the EPSRC to look at this problem. The project is investigating how to develop a de-reverberation algorithm that is suitable for practical applications and which will account for movement between the source of the noise and the sensor attempting to pick it up and also for changes in the acoustical properties of a room. It will focus on developing, implementing, testing and applying a number of models that have not previously been investigated in this area.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Design and fabrication of a high dynamic range log-domain bionic ear

The Department of Bioengineering at Imperial College London received funding from EPSRC in 2004 for a three year study to design and implement a new analogue cochlear signal processor for people with impaired hearing. The aim is to produce a 'bionic ear' which costs less than traditional cochlear implants and which can act as a speech processor and so be used for automatic speech recognition.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Putting people with cognitive impairment in control

Several studies have already shown that people with cognitive impairments, such as learning disabilities or dementia, can benefit from assistive technology, provided sufficient attention is paid to producing systems and products, which are easy to use, and address a clear, specific need. Several projects are working in partnership with people with cognitive impairment to look at the issues that impact on their quality of life and to find assistive technology solutions.

TATE – Through Assistive Technology to Employment

An estimated 1.4 million people in England live with a learning disability. The TATE project aims to develop mainstream technology devices combined with electronic assistive technologies to support and meet the needs of individuals.



© The TATE Project

The project, which began in November 2004 and will run until the end of 2007, is funded by the European Social Fund through the Equal Community Programme and has 18 partners drawn from both the public and the private sector. The lead partner is the Home Farm Trust.

Remote monitoring and the proactive management of day-to-day tasks without the need for a formal or family carer to be present at all times may offer people with learning disabilities the chance to live more independently. The project has been using a range of intelligent sensors linked to a Lifeline home unit, which raises the alarm if help is required, for example in the event of a fall.

The implementation phase is almost completed and will finish in August 2007. Innovative AT devices (such as a disco shower and sound inhibitors) have been installed into trial sites and evaluation is being carried out through questionnaires and face-to-face interviews to produce case studies by the Welsh Centre for Learning Disabilities (WCLD).

Several new software programs will also be completed and on sale by August 2007 (e.g. using technology in the home; finance and budgeting; health and safety at work; assessment tool). A handbook will be produced to inform organisations who wish to implement an AT strategy. This

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will include ethical issues. The project has been granted additional ESF funding to install person-centred telecare, customised to meet individual needs, in up to 50 homes before the project finishes in December 2007.

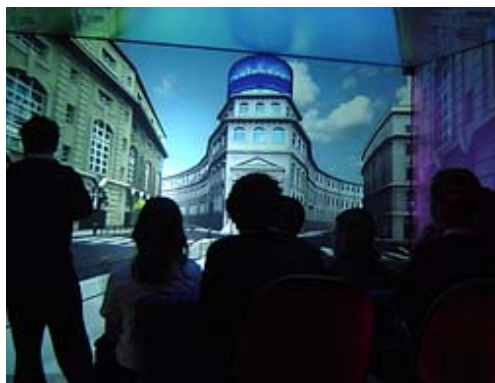
TATE has also been active in establishing the training and education required by professionals to equip them to support people with learning disabilities to identify the assistive technology that will meet their needs. Work to develop a City and Guilds vocationally related qualification (VRQ) level 2 module, undertaken in collaboration with Hereward College, culminated in the launch of the qualification in March 2007.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Evaluation of Two Virtual Reality Technologies with the Potential to Teach Children with Autism Spectrum Disorders

The National Endowment for Science and Technology (NESTA) is funding a study by the Department of Psychology at Oxford University, which is evaluating two virtual reality applications which can be used to teach social skills to children with autism. Research began at the beginning of 2006 and will conclude in July 2007.

Many children with autism have poor social and communication skills and find it hard to empathise with others; one element of this is a lack of awareness of how they should be interacting with others in a given social setting. Virtual reality programmes, aimed at allowing the children to act out potential scenarios and learn patterns of behaviour, may be one possible approach.



This project will evaluate 20 children diagnosed with autism spectrum disorder and 20 computer controls using two different virtual reality systems. The children's responses to both systems will be analysed to compare which technique instils a greater sense of appropriate social behaviour. Group differences in how the children interact will be analysed.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

INDEPENDENT – Investigating Enabling Domestic Environments for People with Dementia

The INDEPENDENT consortium is an interdisciplinary project involving partners who are active in the fields of dementia and technology. They include universities, industry, voluntary organisations and the public and private care sectors. The work is supported by EPSRC under the EQUAL programme.

The emphasis of this project, which ran between November 2003 and November 2006, was on developing technology and design solutions that could enable people with dementia to live independently, to empower them and improve their quality of life. A key aspect of the work was to listen to people with dementia and learn about their daily living requirements in order to assess ways in which technology could help them, and to obtain feedback and recommendations from people with dementia on the suitability, value and effectiveness of proposed products. Four prototype ideas were proposed to participants and one prototype for a music player is currently being taken forward for commercialisation.

Researchers found that easy access to familiar music was an important factor in improving the quality of life for people with dementia, both when living at home and in residential care. The team then had to identify the barriers to consistent and successful use of the music player by people with severe cognitive problems who would be unable to learn to use a complex device with multiple options. As a result of testing work, the project team have produced a Music Player, which is easily identifiable as a music playing device, has a simple control interface and can be pre-loaded with music familiar to the user.



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There are only two user controls; a handle which opens the transparent cover which acts as the music on/off switch, and a large central switch for music track selection. A sign above the player is illuminated for five minutes (and repeated at twenty minute intervals) reminding the user to open the lid to listen to the music.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Supporting the development process

Demographic trends suggest a growing population of older people and the market for assistive technology is therefore expanding fast, but research and development efforts remain fragmented and it can be hard to develop devices that succeed in the mainstream market.

More information about the needs of the target population is required so that researchers and commercial companies can make sure they are concentrating their efforts towards solving the common problems shared by specific groups, and thereby developing products which are more likely to find a mass audience.

ACT – Advanced Care Technologies

ACT is a knowledge transfer project in the field of assistive and telecare technologies (ATT) which has won funding from the European Commission's Regional Structural Funds for an initiative designed to promote regional economic stimulation. It has helped to create a strategic alliance between two Yorkshire-based research departments, the Sheffield Institute for Studies on Ageing (SISA), and Barnsley NHS Foundation Trust. The project aims to enable South Yorkshire companies to benefit from a fast expanding world market for ATT.

The ACT project has two distinct elements. The first is to enable individual companies and organisations based across South Yorkshire to accelerate their internal research processes, meet the increasing demand for ATT and rehabilitation products and services, reduce their initial internal research investment costs and investigate the most effective applications of AAT and rehabilitation devices in the care and support of frail older people.

The second, knowledge transfer element of the ACT project, is designed to forge partnership opportunities and networks with the region's strategic bodies, sector skills and workforce development delivery organisations, business support organisations and to engage with ATT manufacturing companies and supply chains, NHS practitioners, social care delivery organisations and training providers to establish communication with end users.

The objectives of the project include the creation and development of new ATT support and delivery systems. This strand also aims to work with manufacturing and delivery companies to raise the effectiveness and user acceptability of existing ATT products, to provide companies with market intelligence that supports their expansion into new markets, and to stimulate increased research awareness, capacity and activity across South Yorkshire's businesses. The project was launched in late 2006 and is scheduled to complete in 2008.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Simulating user capabilities: providing tools for inclusive design

Product designers do not always involve potential users to evaluate the ease of use of their creations, instead, they often base designs on their own assessment. Since designers are

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typically young and able-bodied, this can result in design solutions which fail to take account of the wide variety of people's functional capabilities.

A team at Cambridge University, with funding from the EPSRC, worked on a year-long project between June 2005 and July 2006 to develop a wearable 'simulation toolkit' that reproduces the symptoms of physical impairments that older and disabled people may experience.



Preliminary results from studies involving designers wearing the toolkit have shown that this tool enabled them to always identify more problems than those found during their self-observation assessments. Designers were also positively surprised at the significant reduction the simulators imposed on their able-bodied capabilities.

Currently, a series of prototypes are being built to be delivered to design companies with the purpose of gaining feedback on the practicality and usefulness of this tool.

[Link to more information on the FAST website \(www.fastuk.org\)](http://www.fastuk.org)

Technology evaluation

Following the transfer of the Device Evaluation Service to the NHS Purchasing and Supply Agency, the Centre for Evidence-based Purchasing (CEP) is focussing its efforts on reviewing available evidence and supporting health and social care organisations to increase the uptake of innovative products and technologies. Three recent reports are:

Absorbent products for urinary/faecal incontinence: a comparative evaluation of key product categories

This evaluation was carried out by the Continence and Skin Technology Group at University College, London between April 2003 and March 2006. Modules 1 and 2 of the study compared absorbent products for moderate and heavy incontinence when used in nursing or residential homes and then for people living in the community. Module 3 compared absorbent products for light incontinence for women living in the community. Module 4 developed an instrument for measuring quality of life for people wearing absorbent products.

Programme of continence and pressure management product evaluation

This evaluation, also carried out by the Continence and Skin Technology group at University College London, aimed to compare similar products such as leg bags, incontinence pads and mattresses in order to provide guidance on product selection for consumers and health service personnel. The project took place between April 2001 and April 2006.

A technical evaluation of wheelchair cushions to assess their ability to prevent pressure sores

This study, being carried out between April 2004 and March 2009, will measure heat and water vapour transfer, pressure distribution, horizontal stiffness and impact damping characteristics on a wide range of commercial products, and is being carried out by the Aspire Centre for Disability Sciences (ACDS) based in Stanmore.

Annex A: overview of AT research and development activity

Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
ACT NoW study - Assessing the effectiveness of Communication Therapy in the North West Research team: Human Communication and Deafness, University of Manchester Contact: 0161 275 3389 Funder: NIHR Health Technology Assessment Programme	This group is testing the effectiveness of an early, intensive therapy intervention delivered by NHS therapists to people who have had stroke. Link to more information on the FAST website (www.fastuk.org)	01/10/2004 28/02/2010
Ageing in Construction Workers Research team: Department of Civil and Building Engineering, University of Loughborough Contact: 01509 222884 Funder: SPARC	The primary aim of this project is to understand the abilities and needs of older workers, to assess how they fit within the changing workplace of the construction industry. Link to more information on the FAST website (www.fastuk.org)	01/10/2006 01/03/2007
AHVIT - Audio Haptics for Visually Impaired Information Technology Research team: Royal National College for the Blind Contact: 01432 265725 Funder: European Commission, Leonardo Da Vinci programme	The aim of this project is to develop online training programmes for visually impaired workers or trainees by using multi-sensory learning so that visual graphical information is presented in a non-visual format using touch and sound. Link to more information on the FAST website (www.fastuk.org)	01/10/2006 01/09/2008
AHVITED - Audio Haptics for Visually Impaired Training and Education at a Distance Research team: Royal National College for the Blind Contact: 01432 265725 Funder: European Commission, Leonardo Da Vinci programme	This project will look at the problems associated with delivering graphical learning materials to visually impaired learners studying by distance learning. This will result in the development of accessible materials and software, primarily designed using 'talking tactile technology'. Link to more information on the FAST website (www.fastuk.org)	01/10/2006 01/09/2009
ALMS – Advanced Lifestyle Monitoring Systems Research team: Dept of Medical Physics and Clinical Engineering – Barnsley Hospital NHS Foundation Trust Contact: 01226 730000 Funder: Department of Health HTD programme	The proposed advanced lifestyle monitoring system is part of the third generation of telecare and will provide sophisticated monitoring of the well-being of older people in their own home. Link to more information on the FAST website (www.fastuk.org)	01/04/2006 01/04/2009
ARTEMIS - Advanced Rehabilitation Technologies for Elderly and Mobility impaired persons applied through innovative Internet Services Research team: Department of Medical Physics and Clinical Engineering, Barnsley Hospital NHS Foundation Trust Contact: 01226 730000 Funder: European Commission, FP5	This project involves partners from five European countries and aims to create a single system that is capable of supporting the various approaches to provision of AT (for access to IT) across the partner countries. Output includes a report on ethics in AT. Link to more information on the FAST website (www.fastuk.org)	01/07/2003 30/09/2006

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
ASK-IT - ambient intelligence system of agents for knowledge-based and integrated services for mobility impaired users Research team: School of Civil Engineering & Geosciences, University of Newcastle Contact: 0191 222 6323 Funder: European Commission, FP6	This project is developing out-door equipment, services and information sources for mobility-impaired people to use in transit. Link to more information on the FAST website (www.fastuk.org)	01/10/2004 30/09/2008
AT commands for assistive mobile device interfaces Research team: School of Computing, University of Dundee Contact: 01382 344151 Funder: European Telecommunications Standards Institute (ETSI)	This project will produce a technical specification for assistive mobile devices which will set out the requirements for the commands that can be used to enable assistive devices to interact satisfactorily with mobile terminals. Link to more information on the FAST website (www.fastuk.org)	31/03/2006 31/03/2008
BenToWeb Research team: Human Computer Interaction Research Group, University of York Contact: 01904 432722 Funder: European Commission, FP6	This project aims to support European public and private sectors to implement new software modules and methodologies that satisfy some of the accessibility recommendations of the Web Accessibility Initiative (WAI) of the World Wide Web Consortium (W3C), which are not analysed by existing tools due to their complexity. Link to more information on the FAST website (www.fastuk.org)	01/09/2004 31/08/2007
Biomechanical, mechanical and virtual modelling of ankle foot orthoses in the management of Cerebral Palsy Research team: University of Central Lancashire Contact: 01772 89567 Funder: Lancashire Teaching Hospitals NHS Foundation Trust	This project aims to evaluate the effectiveness of different designs of ankle foot orthoses (ankle splints) in adults with cerebral palsy and to develop a computerised virtual model with the potential to investigate a fitness for purpose of new designs of ankle foot orthoses. Link to more information on the FAST website (www.fastuk.org)	05/09/2005 05/09/2008
BioMed Health Technology Co-operative Research team: BioMed Centre, Southmead Hospital Contact: 0117 959 5690 Funder: Department of Health	This Co-operative was created to accelerate the development and adoption of new technologies, treatments and devices for patients with intractable urinary incontinence. Link to more information on the FAST website (www.fastuk.org)	01/04/2005 31/03/2008
Books for All Research team: CALL Centre, University of Edinburgh Contact: 0131 651 6235 Funder: Scottish Executive Education Department	The aim of the project is to investigate the need for books and other learning materials to be provided in alternative, accessible formats in schools in Scotland. Link to more information on the FAST website (www.fastuk.org)	01/11/2006 01/05/2007
COGAIN – Communication by Gaze Interaction Research team: ACE Centre – Advisory Trust Contact: 01865 759800 Funder: European Commission, FP6	The project provides a forum for bringing together researchers, equipment developers, user representatives and users of eye gaze communication technology with the common aim of integrating the expertise to develop new, improved and affordable technology. Link to more information on the FAST website (www.fastuk.org)	01/09/2004 31/08/2009

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
Cogniron - cognitive robot companion Research team: Adaptive Systems Research Group, University of Hertfordshire Contact: 01707 284303 Funder: European Commission, FP6	A European project with ten partners studying how to develop robots which could operate as assistants to humans in their daily environment. The UK team is focusing on imitation learning, human perceptions of robots and robot/human interaction. Link to more information on the FAST website (www.fastuk.org)	01/01/2004 31/12/2007
Comparative study of the effectiveness of treatment of contracture with mechanically applied stretch and heat Research team: Orthotic Research and Locomotor Assessment Unit (ORLAU) Contact: 01691 404531 Funder: Action Medical Research, NHS R&D Support Funding	The study looked at a new way of increasing the movement in a joint using the combined effects of heat and stretching with a specially designed splint. Link to more information on the FAST website (www.fastuk.org)	01/04/2003 30/09/2006
Consulting people with memory loss Research team: Faculty of Health and Social Care, University of West of England Contact: 0117 3288534 Funder: Department of Health, Section 64 grant	The principal aims of this research are to identify ways in which people with memory loss can be helped to make and articulate choices and then communicate these choices to ensure service improvement. Link to more information on the FAST website (www.fastuk.org)	01/01/2006 01/01/2008
Design and community regeneration: investigating personal safety concerns of older people in socio-economically deprived communities in South Wales Research team: Faculty of Advanced Technology, University of Glamorgan Contact: 01443 480 480 Funder: SPARC	Virtual reality technology was used to explore how older people's perception of the physical and social environment can generate fears which give rise to social exclusion and reduced quality of life, and to illustrate how designers can address this. Link to more information on the FAST website (www.fastuk.org)	31/01/06 31/10/06
Designer relevant biomechanical data: packages opening in an older adult population Research team: Design, Manufacturer and Engineering Department, University of Strathclyde Contact: 0141 548 2091 Funder: SPARC	The project will look at the reasons why designers do not make as much use as they could of biomechanical data when designing packaging. Link to more information on the FAST website (www.fastuk.org)	11/01/2006 10/01/2007
Development of a clinically user-friendly device to measure posture Research team: Centre for Rehabilitation and Human Performance Research, University of Salford Contact: 0161 295 2275 Funder: Department of Health, NEAT	The project will develop a portable device to measure posture which is suitable for use with people with a wide range of impairments and will give immediate results without specialist staff or resources. Link to more information on the FAST website (www.fastuk.org)	01/12/2005 30/06/2008
Development of an intelligent robotic system to aid physical therapy in stroke Research team: Academic Department of Rehabilitation Medicine, University of Leeds Contact: 0113 392 4719 Funder: Department of Health, NEAT	The project involves developing a robotic system that provides intelligent, interactive, safe movement treatment to help recovery of arm weakness after stroke. Link to more information on the FAST website (www.fastuk.org)	01/11/2004 30/11/2007

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
<p>Development of powered support and load indication functions for the ORLAU rear support walking frame.</p> <p>Research team: Orthotic Research and Locomotor Assessment Unit (ORLAU) Contact: 01691 404531 Funder: Department of Health, NEAT</p>	<p>This project established the feasibility of providing immediate post-operative walking rehabilitation for patients with traumatic or acquired lower limb injury in a manner that ensures safety in a variety of environments. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/04/2004 30/09/2006</p>
<p>Dynamic Faces: understanding the dynamics of real faces</p> <p>Research team: Centre for Vision, Speech and Signal Processing (CVSSP), University of Surrey Contact: 01483 686030 Funder: EPSRC</p>	<p>This research is investigating how to develop believable animation of real faces from speech, a process which will enable effective visual communication for teleconferencing, provide visual aids for people with hearing loss and support realistic animation in entertainment production for film, broadcast and games. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/10/2005 30/09/2008</p>
<p>ECLIPSE - European Cooperation and Learning to ImpLement transport Solutions to combat Exclusion</p> <p>Research team: Transport & Travel Research Ltd Contact: 01543 416416 Funder: European Commission, TEP</p>	<p>The project will raise awareness of the need for transport policy makers and social agencies to cooperate; bring together social exclusion and transport professionals and produce a catalogue of best practice, bench-marking guidelines and evaluation tools to assist transport professionals in combating the issue of exclusion. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/04/2006 01/04/2008</p>
<p>ECO-VIP</p> <p>Research team: Royal National College for the Blind Contact: 01432 265725 Funder: European Commission, Leonardo Da Vinci programme</p>	<p>The aim of the project is to develop a training course for eLearning coaches and ICT trainers which will qualify participants to educate blind and partially sighted learners via e-learning. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/11/2006 01/10/2008</p>
<p>Effect of different angles of tilt-in-space wheelchairs on the posture and function of children with cerebral palsy</p> <p>Research team: Chailey Heritage Clinical Services Contact: 01825 722112 Funder: Association of Paediatric Physiotherapists; NHS R&D Support Funding</p>	<p>To determine the impact on postural ability and spinal profile of using tilt-in-space wheelchairs in the backwardly tilted and upright positions. Link to more information on the FAST website (www.fastuk.org)</p>	<p>22/12/2005 01/09/2007</p>
<p>Effects of seating on the scoliotic deformity and posture in non-ambulant individuals</p> <p>Research team: Rehabilitation Engineering, Leeds Teaching Hospitals NHS Trust Contact: 0113 2623404 Funder: British Scoliosis Research Foundation; NHS R&D Support Funding</p>	<p>The aim of this project is to develop a clinical measurement system for identifying the best seating system for a patient in the management of spinal deformity and posture. Link to more information on the FAST website (www.fastuk.org)</p>	<p>28/05/2004 01/08/2007</p>
<p>EIAO - European Internet Accessibility Observatory</p> <p>Research team: Centre for Research in Library and Information Management, Manchester Metropolitan University Contact: 0161 247 6153 Funder: European Commission, FP6</p>	<p>The project will assess the accessibility of European web sites and participate in a cluster developing a European Accessibility Methodology. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/01/2004 01/01/2008</p>

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
ENABLED - enhanced network accessibility for the Blind and visually impaired Research team: Virtual Engineering Centre (VEC), Queen's University Belfast Contact: 028 9097 4778 Funder: European Commission, FP6	The goal of this integrated project is to enhance blind and visually impaired people's access to information and services on the internet. Link to more information on the FAST website (www.fastuk.org)	01/09/2004 31/10/2007
Engineering research for spinal cord injury: a short video film initiative Research team: Centre for Rehabilitation Engineering, University of Glasgow Contact: 0141 330 2468 Funder: EPSRC	This project has produced a 25 minute video/DVD film exploring a UK-based programme of engineering-driven research that aims to restore function and enable effective exercise for people living with spinal cord injury. Link to more information on the FAST website (www.fastuk.org)	01/11/2004 31/07/2006
Enhanced sheltered housing on Anglesey: assistive technology pilot scheme Research team: Isle of Anglesey County Council Contact: 01248 750057 Funder: Supporting People (Welsh National Assembly grant)	The project established appropriate service patterns for the delivery of assistive technology to support vulnerable older people (particularly those with mild to moderate dementia) in a sheltered housing context. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 31/03/2007
EQUATOR – Technological Innovation in Physical and Digital Life Research team: School of Computer Science and Information Technology, University of Nottingham Contact: 0115 951 4254 Funder: EPSRC	This Interdisciplinary Research Collaboration (IRC) brings together researchers from eight different institutions and a variety of disciplines that address the technical, social and design issues in the development of new inter-relationships between the physical and digital. Link to more information on the FAST website (www.fastuk.org)	01/10/2000 30/06/2007
Ergonomic Self Propelled Wheelchair (ESP): energy expenditure and ride comfort Research team: Clinical Research Centre for Health Professions, University of Brighton Contact: 01273 643647 Funder: Department of Health HTD programme	This is a pilot project to evaluate a specially designed ergonomic self propelled (ESP) wheelchair kit which will convert a standard manual wheelchair so that it can be used by people with hemiplegia (one sided weakness). Link to more information on the FAST website (www.fastuk.org)	01/01/2007 30/06/2008
EUAIN - European Accessible Information Network Research team: Royal National Institute for the Blind Contact: 020 7388 1266 Funder: European Commission, FP6	EUAIN will take the broadest definition of "content creators" and will provide the support, tools and expertise to enable them to provide accessible information in both paper and digital formats. Link to more information on the FAST website (www.fastuk.org)	01/11/2004 01/03/2007
Evaluation of a vibro-tactile sensory aid project - development of a tactile vest Research team: School of Medicine, Imperial College, London Contact: 020 8846 7634 Funder: Medical Research Council component grant	This project will explore the possibility that vibro-tactile channels for indicating spatial orientation can be exploited as a sensory prosthesis, which could be used to speed rehabilitation. Link to more information on the FAST website (www.fastuk.org)	01/06/2004 01/06/2007

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
<p>Evaluation of a virtual environment for Stroke rehabilitation Research team: Division of Rehabilitation and Ageing, University of Nottingham Contact: 0115 970 9408 Funder: Stroke Association; NHS R&D Support Funding</p>	<p>The project replicated a standardised hot drink making assessment in order to test the concept of 'virtual' rehabilitation. Link to more information on the FAST website (www.fastuk.org)</p>	<p>06/10/2003 07/04/2006</p>
<p>Evaluation of the impact of an Odstock Dropped Foot Stimulator (ODFS) on locomotion and activity patterns in people with Multiple Sclerosis Research team: Walton Centre for Neurology and Neurosurgery NHS Trust Contact: 0151 525 3611 Funder: NHS internal funding</p>	<p>The study will investigate the impact of the provision of an ODFS for footdrop (inability to lift the foot clear of the floor when walking) has on the walking ability of people with MS. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/01/2005 31/05/2007</p>
<p>E-YES Research team: Royal National College for the Blind Contact: 01432 26525 Funder: European Commission, Leonardo Da Vinci programme</p>	<p>The aim of this project is to develop new tools for creating and managing eLearning programmes which are fully accessible to visually impaired people. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/11/2006 01/10/2008</p>
<p>FATKAD: development of Functional Assessment Tools to evaluate the pre-clinical performance of a novel Knee hemi-Arthroplasty Device Research team: School of Engineering Sciences, University of Southampton; School of Bioengineering, University of Leeds Contact: 0113 343 21254 Funder: EPSRC and BBSRC under the Medical Devices Faraday Partnership research programme</p>	<p>This project is looking at new ways of designing knee implant devices. The work has led to an industrial research and development project funded by Yorkshire Forward and DePuy which will run from 2006 to 2008. Link to more information on the FAST website (www.fastuk.org)</p>	<p>4/04/2004 04/07/2007</p>
<p>Feasibility study for a free knee reciprocal walking orthosis Research team: Orthotic Research and Locomotor Assessment Unit (ORLAU) Contact: 01691 404531 Funder: Department of Health, HTD Programme</p>	<p>This project developed and tested the principles and feasibility of three concept designs for a controllable orthotic knee joint that can be locked and unlocked at different points in the gait cycle. One of the three prototypes is now being formally tested. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/06/2004 31/12/2006</p>
<p>Functional Electrical Stimulation (FES) rowing project Research team: Aspire Centre for Disability Sciences (ACDS) Contact: 020 8954 5759 Funder: EPSRC</p>	<p>The aim of the project is to develop new technology that enables paraplegics to participate in a mainstream activity for health, leisure and sport. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/01/2006 01/01/2009</p>
<p>HAPTEX - haptic sensing of virtual textiles Research team: School of Physics, University of Exeter Contact: 01392 264083 Funder: European Commission, FP6</p>	<p>This project will investigate how far it is possible to provide a user with a completely reliable sense of fabric through a virtual experience without using vision. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/12/2004 30/11/2007</p>

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
Healthcare@Home Research team: School of Computer Science, Cardiff University Contact: 029 2087 4812 Funder: Department of Trade and Industry Technology Programme	The project will develop an integrated system for health data monitoring. Within the system, information about individual users can be recorded using physiological and clinical equipment. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 30/06/2007
Health-eLife Research team: Docobo (UK) Ltd Contact: 01372 459866 Funder: European Commission, e-Ten	This project validated a remote healthcare monitoring system (Doc@Home) as a way of managing patients with long term conditions in their own homes as an alternative to hospital in-stay and attendance at outpatient clinics. The service was trialled in several European hospital outpatient clinics including, in the UK, clinics for hypertensive diabetes. Link to more information on the FAST website (www.fastuk.org)	01/03/2005 01/06/2006
Healthy Aims Research team: Centre for Rehabilitation and Human Performance Research, University of Salford Contact: 0161 295 2275 Funder: European Commission, FP6	Twenty six partners including research organisations, design companies, manufacturers, clinicians and surgeons are collaborating to bring new designs in the area of medical implants and functional electrical stimulation from concept into production. Link to more information on the FAST website (www.fastuk.org)	01/12/2003 01/12/2007
HEARCOM - hearing in the communication society Research team: Department of Phonetics and Linguistics, University College, London Contact: 020 7679 2000 Funder: European Commission, FP6	This project will integrate European high-level expertise in audiology, acoustics, speech technology and ICT to find ways of reducing limitations in auditory communication, whether they are due to hearing loss or poor environmental conditions. Link to more information on the FAST website (www.fastuk.org)	01/09/2005 27/02/2007
I~design 3: extending active living through more effective inclusive design Research team: Engineering Design Centre, University of Cambridge Contact: 01223 332600 Funder: EPSRC	This project will extend the focus of earlier i~design work to encourage industry and government to take on board the principles and practice of inclusive design. Key project goals are to produce better descriptions of users of products and services, linked to more accurate data, and represented in designer-friendly formats. Link to more information on the FAST website (www.fastuk.org)	01/10/2006 30/09/2010
Identifying key needs of people with Dementia that can be supported by technology in the home Research team: Centre for Usable Home Technology (CUHTec), University of York Contact: 01904 433178 Funder: EPSRC	Dementia affects the ability to plan and carry out everyday activities, and this project will to identify those that are most important and suggest possible technological interventions that will enable patients in the early stages of dementia to carry out some selected tasks. Link to more information on the FAST website (www.fastuk.org)	01/10/2004 30/09/2007

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
IDGO – Inclusive Design for Getting Outdoors Research team: OpenSpace Research Centre, Edinburgh College of Art Contact: 0131 221 6177 Funder: EPSRC , EQUAL initiative	This project focused on ways to improve design so that the environment does not hinder people and set up barriers to outdoor access. Link to more information on the FAST website (www.fastuk.org)	02/09/2003 01/09/2006
IDGO TOO – Inclusive Design for Getting Outdoors 2 Research team: Research Institute for the Built and Human Environment, University of Salford Contact: 0161 295 4600 Funder: EPSRC	The project will investigate how well outdoor environments built to respond to government policies on inclusion, accessibility, sustainability, etc, can contribute to older people’s health and well-being. Link to more information on the FAST website (www.fastuk.org)	02/01/2007 01/04/2011
I-MATCH Research team: Centre for Rehabilitation and Engineering Studies, University of Newcastle upon Tyne Contact: 0191 222 6170 Funder: European Commission, e-TEN	This project aimed to develop a system to optimise the selection of an interface for a user by measuring both the functional characteristics of the device (e.g. joystick, switch, mouse etc) and the skills of the user. Link to more information on the FAST website (www.fastuk.org)	01/11/2002 30/04/2006
Improving computer interaction for older users: an investigation of dynamic on-screen targets Research team: Department of Cybernetics, University of Reading Contact: 0118 378 8219 Funder: SPARC	This project will study the use of dynamic targets, such as expanding icons, as a means of improving the ways in which older people can interact with computers. Link to more information on the FAST website (www.fastuk.org)	01/10/2006 01/09/2007
Inclusive Design 2: providing tools to improve quality of life for the wider population Research team: Department of Engineering, University of Cambridge Contact: 01223 332600 Funder: EPSRC	This project builds on a previous project, INCLUDE, and looks at ways to ensure products and services are designed so that as many people as possible can use them Link to more information on the FAST website (www.fastuk.org)	01/04/2004 31/12/2007
Inclusive Views Research team: Inclusive Technologies Contact: 01457 819790 Funder: National Endowment for Science, Technology and the Arts	This project supported designers to develop products and services that could be widely used by people throughout the UK and the rest of the world. Designers had access to funding of up to £22,000 and professional development support to help them take their ideas to the next stage of commercialisation. Link to more information on the FAST website (www.fastuk.org)	01/10/2005 30/09/2007
Integrated voluntary control of unsupported paraplegic standing Research team: Centre for Rehabilitation Engineering, University of Glasgow Contact: 0141 330 2528 Funder: EPSRC	This project has generated new approaches to the control of standing and balance in people with neurological impairment resulting from spinal cord injury or stroke, which will be used to develop clinical balance training devices Link to more information on the FAST website (www.fastuk.org)	01/03/2002 30/04/2006

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
Integrating the technological and social models of later life in the maintenance and adaptation of private housing Research team: London South Bank University Contact: 020 7815 6917 Funder: SPARC	The project is a feasibility study into whether information and visualization technology might be appropriate in improving the design and implementation of adaptations of housing of older owner occupiers. Link to more information on the FAST website (www.fastuk.org)	01/10/2005 01/01/2007
Investigation into the feasibility of using a computer-based voice synthesiser for assisting communication in adults recovering from critical illness Research team: John Farman Intensive Care Unit, Addenbrookes Hospital Contact: 01223 217 474 Funder: ACACIA; NHS R&D Support Funding	The project is assessing whether critically unwell patients have sufficient skills to access a speech-output communication aid. Link to more information on the FAST website (www.fastuk.org)	01/12/2004 28/06/2007
Is there an objective measure of the benefit afforded by precision tinted spectacles in subjects with Dyslexia? Research team: Institute of Child Health, Great Ormond Street Hospital Contact: 020 7242 9789 Funder: NHS R&D Support Funding	This project will monitor brain activity using multi-channel mapping techniques to investigate the suggestion that tinted spectacles relieve the visual disturbance experienced by some dyslexics when reading. Link to more information on the FAST website (www.fastuk.org)	01/08/2002 31/01/2008
KPT – Keeping Pace with (assistive) Technology Research team: ACE Centre Advisory Trust Contact: 01865 759800 Funder: European Commission, Leonardo Da Vinci programme	The aim of the project is to meet the lifelong learning needs of professionals working with people with disabilities in health services, social services and vocational training. Link to more information on the FAST website (www.fastuk.org)	01/11/2004 31/10/2007
LISTEN: proposed project for the Minerva initiative Research team: Cloudworld Ltd Contact: 0845 458 3944 Funder: European Commission, Socrates education initiative	The project will show how certain innovative, affordable and accessible teaching technology (e-learning platform) can improve the teaching of basic literacy and language skills, especially for children with special needs. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 01/01/2007
Making games: developing games authoring software for educational and creative use Research team: Institute of Education, University of London Contact: 020 7612 6000 Funder: PACCIT	The project has developed a software prototype that will allow children to design their own role playing and action adventure computer games, focusing on the needs of children with print-literacy problems. Link to more information on the FAST website (www.fastuk.org)	01/09/2003 31/08/2006
MAPPED – Mobilisation and accessibility planning for people with disabilities Research team: BMT Research and Development Directorate Contact: 020 8943 5544 Funder: European Commission, FP6	The project aims to deliver a route planner which will enable users to plan excursions from any point to any other point, at any time, using public transport, their own vehicle, walking, or using a wheelchair, taking into consideration all their accessibility needs Link to more information on the FAST website (www.fastuk.org)	01/09/2004 01/08/2007

Research and Development Work Relating to Assistive Technology

Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
MATCH - Mobilising Advanced Technologies for Care at Home Research team: Dept of Computing Science and Mathematics, University of Stirling Contact: 01786 467423 Funder: Scottish Higher Education Funding Council	The goal of MATCH is to develop a research base for advanced technologies in support of social and health care at home Link to more information on the FAST website (www.fastuk.org)	01/11/2005 30/10/2009
Mathematical Modelling of age related differences in web browsing Research team: Centre for Human Computer Interaction Design, City University Contact: 020 7040 8427 Funder: SPARC	This project will investigate age-related differences in web browsing and will attempt to develop predictive mathematical models that describe these differences. Link to more information on the FAST website (www.fastuk.org)	01/10/2006 01/09/2007
MATILDAH – making advanced technology useful for independent living for disabled people at home Research team: School of Education, Social Work and Community Education, University of Dundee Contact: 01382 464000 Funder: ESRC	The project will use multiple methods to determine the need, usage, utility, abandonment and preferred design of technological applications to enhance independent living in the home. Link to more information on the FAST website (www.fastuk.org)	23/10/2006 22/10/2008
MDDS – Method for Dependable Domestic Systems Research team: Department of Computing, Lancaster University Contact: 01524 593041 Funder: EPSRC	This project aims to design a checklist consisting of a series of questions which can help social care professionals and AT users to determine the appropriateness and dependability of any particular AT system. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 01/01/2008
MICOLE – multimodal collaboration environment for inclusion of visually impaired children Research team: Multimodal Interaction Group, University of Glasgow Contact: 0141 330 4256 Funder: European Commission, FP6	The project aims to develop a system that supports collaboration, data exploration, communication and creativity for visually impaired and sighted children. Link to more information on the FAST website (www.fastuk.org)	01/09/2004 31/08/2007
Monmouthshire Community Alarm Service telecare trial Research team: Social and Housing Services Monmouthshire County Council Contact: 01633 644469 Funder: Supporting People Grant	This project piloted the provision of an appropriate selection of ‘smart’ sensors and a Lifeline unit in the homes of vulnerable individuals to enable them to live independently and safely in their own homes for longer. Link to more information on the FAST website (www.fastuk.org)	28/09/2004 28/09/2006
Multiplicative and fractal noise coding for cochlear implants Research team: School of Engineering, University of Warwick Contact: 0247 6528193 Funder: EPSRC	The project builds on a previous pilot study and is investigating the benefit of multiplicative and fractal noise in more complete models of the electrically stimulated ear to determine how to optimise information transmission. Link to more information on the FAST website (www.fastuk.org)	01/04/2005 31/03/2008

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
<p>Multisource - audio-visual speech recognition in the presence of non-stationary noise Research team: Department of Computer Science, University of Sheffield Contact: 0114 222 1800 Funder: EPSRC</p>	<p>This project concerns the development of novel techniques for exploiting visual speech information (e.g. lip and face movements) in the design of automatic speech recognition systems. Link to more information on the FAST website (www.fastuk.org)</p>	<p>28/02/2005 27/05/2007</p>
<p>MultiVis II: multimodal tools to allow blind people to create and manipulate visualisations Research team: Multimodal Interaction Group, University of Glasgow Contact: 0141 330 4256 Funder: EPSRC</p>	<p>The project aims to develop new ways to overcome the confusion and navigation problems often experienced by blind people when engaging in two-handed interaction on paper. It will augment existing paper-based technologies with haptics and sound to maximise the usefulness of visualisations. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/07/2004 30/06/2007</p>
<p>National information Resource of assistive technologies for people with Dementia Research team: Trent Dementia Service Development Centre Contact: 0116 257 5017 Funder: Department of Health, Section 64 grant</p>	<p>The project has developed a web-based information resource on assistive technologies for people with dementia. This was launched in early 2007 and includes a database of products. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/09/2005 01/09/2008</p>
<p>Network 1000: Surveying the changing needs of 1000 people with visual impairment Research team: VICTAR - Visual Impairment Centre for Teaching and Research,- University of Birmingham Contact: 0121 414 6733 Funder: Big Lottery Fund; Community Fund</p>	<p>The project developed a nationwide panel of 1000 people with vision impairment and collected data over a three year period on issues such as employment, education, disability and barriers to mobility. The final report offered a significant analysis into the lives of people who are rarely represented in surveys. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/03/2004 28/02/2007</p>
<p>Neuro-muscular stimulation via the sacral nerve roots to improve tissue viability in spinally injured patients Research team: Royal National Orthopaedic Hospital Trust Contact: 020 8909 5343 Funder: NHS R&D support funding</p>	<p>The project examined the effect of FES on tissue status in acute and chronic situations. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/06/2003 01/06/2006</p>
<p>Novel Stimulator Implant with Sensory Feedback for Multi-Functional Restoration after Spinal Cord Injury Research team: Dept of Medical Physics and Bioengineering, University College London Contact: 020 7679 6262 Funder: EPSRC</p>	<p>The aim of the project is to develop and make a novel multi-functional implant to stimulate bladder control as an alternative to current methods. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/01/2006 31/12/2008</p>
<p>NOW Project - North Wales minor injuries and teledermatology. Research team: Welsh Telemedicine, North Wales NHS Trust Contact: 029 20 825596 Funder: Welsh Assembly</p>	<p>To provide health services to rural communities in Wales using Telemedicine and Telecare. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/01/2003 01/01/2007</p>

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
OATS - Open Source Assistive Technology Software - a pilot project Research team: ACE Centre Advisory Trust Contact: 01865 759800 Funder: South Birmingham Primary Care Trust	The project developed a single point of contact for obtaining open source software and offered developers a forum to write software to meet the needs of specific users. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 31/03/2006
Optimising quality of sleep among older people in the community and care homes: an integrated approach Research team: Department of Sociology, University of Surrey Contact: 01483 689365 Funder: ESRC	This collaborative research project addresses practice and policy issues arising from the nature, impact and management of the sleep-wake balance in later life. Includes the development and evaluation of novel sensor-based devices to improve sleep. Link to more information on the FAST website (www.fastuk.org)	01/12/2006 01/12/2010
OPTI-WORK - Optimising strategies for integrating people with disabilities into work Research team: Department of Health and Social Care, London School of Economics Contact: 020 7955 6840 Funder: European Commission, FP6	The project aims to add value to EU and national employment policy and national systems to promote the integration of people with disabilities into the labour market. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 01/01/2008
Preliminary study using iterative learning control for the re-education of upper limb function mediated by functional electrical stimulation in healthy adults Research team: School of Health Professions and Rehabilitation Science, University of Southampton Contact: 023 8059 3131 Funder: EPSRC	The research is investigating whether training arm movements with a robot, and using electrical stimulation of the arm muscles adjusted in response to the patient's performance, are feasible ways of improving recovery of arm function following stroke. Link to more information on the FAST website (www.fastuk.org)	01/04/2005 31/03/2008
Prolonging safe driving behaviour through technology: attitudes of older drivers Research team: Centre for Transport and Society, University of the West of England Contact: 0117 32 83219 Funder: SPARC	The project will work with a group of older people to identify their needs when driving a car and develop commercial ideas to fulfil them. Link to more information on the FAST website (www.fastuk.org)	01/06/2006 01/06/2007
SAPHE – Smart and Aware Pervasive Healthcare Environments Research team: Consortium led by Innovation Centre, Imperial College London Contact: 020 7594 5928 Funder: Department of Trade and Industry Technology Programme	This project aims to develop a new generation of telecare networks using miniaturized wireless sensors worn either on the body or embedded in the environment to provide intelligent, unobtrusive and continuous healthcare monitoring. Link to more information on the FAST website (www.fastuk.org)	01/03/06 01/02/2009
SEE - VIP Research team: Royal National College for the Blind Contact: 01732 265725 Funder: European Commission, Socrates/Grundtvig 1 framework	The aim of the project is to analyse the learning needs of people with visual impairment, to specify the curricula for e-learning courses and to investigate the opportunities for people with a visual disability to work in ICT. Link to more information on the FAST website (www.fastuk.org)	01/11/2005 01/10/2007

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
SESAME - sensing for sport and managed exercise Research team: Department of Computer Science, University College London Contact: 020 7769 7214 Funder: EPSRC	The project's goals are to improve athletes' performance and advance sports science using a range of both hardware and software technologies which will be generic and may also have applicability for rehabilitation and for disabled people. Link to more information on the FAST website (www.fastuk.org)	01/07/2006 01/07/2010
Support-EAM - supporting the creation of an e-accessibility mark Research team: Dublin City University Contact: 353 1 7005566 Funder: European Commission, FP6	An international project to make the thousands of applicable web services accessible to people with disabilities within the next few years. Link to more information on the FAST website (www.fastuk.org)	01/10/2004 01/06/2006
Surface textures for affective communication Research team: School of Mechanical Engineering, University of Leeds Contact: 0113 34 32155 Funder: EPSRC	The project will attempt to find a meaningful way of analysing the feelings aroused by specific textures and the emotional response in individuals. Link to more information on the FAST website (www.fastuk.org)	01/04/2006 31/03/2009
Tactons: an investigation of multimodal interaction with tactile displays Research team: Multimodal Interaction Group, University of Glasgow Contact: 0141 330 4256 Funder: EPSRC	The research will investigate a range of tactile displays to improve the whole experience of computer haptics. Link to more information on the FAST website (www.fastuk.org)	01/10/2003 30/09/2008
Tactons: tactile icons for information presentation Research team: Department of Computing Science, University of Glasgow Contact: 0141 330 4256 Funder: EPSRC	This project investigates how to design effective tactile cues with both pin array devices and single-point vibration motors to allow for more flexible input. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 01/01/2007
Telecare Support for People Living with Diabetes Research team: Warwick Medical School Contact: 02476 522891 Funder: Department of Health via Warwick-West Midland Primary Care Research	Nurses and lay advisors experienced in diabetes self-management provided telephone support and advice to patients referred from primary care for up to 6 months after a change in diabetes treatment. Link to more information on the FAST website (www.fastuk.org)	01/04/2004 31/03/2006
Tenuta: simplified guidance for usability and accessibility Research team: Human Computer Interaction Group, University of York Contact: 01904 432722 Funder: European Commission, e-TEN	The project will help improve the usability and accessibility of transnational EU e-services supported by the EU eTEN programme. Link to more information on the FAST website (www.fastuk.org)	01/05/2005 01/04/2007
TESS - Testing Evaluation of Speech Synthesis Research team: Centre for Speech Technology Research, University of Edinburgh Contact: 0131 650 4434 Funder: EPSRC	The project is working to develop a reliable method for evaluating the quality of synthetic speech. Link to more information on the FAST website (www.fastuk.org)	01/01/2005 31/12/2007

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
<p>TIMP: integrated user-centred design and manufacturing process for generating tactile maps using innovative print technology Research team: Human Computer Interaction Research Group, University of York Contact: 01904 432722 Funder: EPSRC</p>	<p>The project has adapted existing print technology so that the printer can print onto many different sorts of media and the height of the letters, shapes or Braille can be controlled. The project is looking into the commercialisation of this product. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/01/2003 31/03/2006</p>
<p>To assess the effectiveness of postural management programmes in reducing hip dislocation in children with bilateral Cerebral Palsy Research team: Chailey Heritage Clinical Services Contact: 01825 722112 Funder: NHS R&D Support Funding</p>	<p>The project aims to determine whether the early introduction of postural management equipment can reduce levels of hip subluxation at 5 years compared to an historical control group. Link to more information on the FAST website (www.fastuk.org)</p>	<p>28/02/2005 31/01/2008</p>
<p>Transport and older people: integrating transport planning tools with users needs Research team: Institute for Transport Studies, University of Leeds Contact: 0113 343 5325 Funder: SPARC</p>	<p>The project will work with focus groups in areas which are less well served by public transport to identify factors relevant to accessibility for older people which are not included in current planning. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/03/2006 31/01/2007</p>
<p>Understanding the design of the workplace for the older worker Research team: Robens Centre for Health Ergonomics, University of Surrey Contact: 01483 689213 Funder: SPARC</p>	<p>This study will explore the match between older workers' capacities, abilities and expectations, and the organisational requirements and strategies needed to support these in both the office and manual employment sectors. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/10/2006 30/09/2007</p>
<p>Use of ankle foot orthoses by people with Charcot Marie Tooth disease: patients priorities and preferences Research team: Rehabilitation Research Unit, Derby Hospitals NHS Foundation Trust Contact: 01332 625599 Funder: NHS R&D support funding</p>	<p>This project looked at the factors perceived by users and professionals as contributing to the quality and effectiveness of an ankle foot orthosis, and assessed how these two groups prioritised them. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/12/2005 01/05/2006</p>
<p>Use of multi-sensory stimulation to improve process skills within functional performance of older people with Dementia Research team: School of Health Professions & Rehabilitation Sciences, University of Southampton Contact: 023 8059 3131 Funder: Department of Health Nursing & Allied Health Professions Research Development Award</p>	<p>50 older people with a clinical diagnosis of moderate to severe dementia were allocated to a multi-sensory environment group or to a gardening group. Both groups completed a range of assessment tools pre- and post-activity. Link to more information on the FAST website (www.fastuk.org)</p>	<p>01/02/2003 31/07/2006</p>

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Project title Lead organisation(s) Funder(s)	Project summary	Start and finish dates
Use of video games to prevent the 'never learned to use' component of disability arising from hemiplegia after perinatal stroke Research team: Department of Clinical Medical Sciences, University of Newcastle Contact: 0191 222 7149 Funder: Newcastle Upon Tyne Hospitals NHS Trust	The project is looking at whether video games could encourage children who have suffered damage to their brain to undertake specific exercises designed to stimulate the neural pathways. Link to more information on the FAST website (www.fastuk.org)	01/09/2006 31/08/2007
VIVOCA - Voice Input Voice Output Communication Aid Research team: Dept of Medical Physics and Clinical Engineering, Barnsley Hospital NHS Foundation Trust Contact: 01226 730000 Funder: Department of Health, NEAT	The project aims to develop a portable (eventually body-worn) speech-in/speech-out communication aid for people with disordered or unintelligible speech, initially concentrating on people with moderate to severe dysarthria. Link to more information on the FAST website (www.fastuk.org)	01/11/2004 01/11/2007
Walking in cluttered environments: visual influences on gait in Parkinson's disease Research team: School of Psychology and Clinical Language Sciences, University of Reading Contact: 0118 378 8523 Funder: EPSRC	This project proposes to measure slowing, hesitation and veering in Parkinson's Disease, as patients negotiate doorways and other objects. Link to more information on the FAST website (www.fastuk.org)	01/09/2005 31/08/2008
Wired for the Third Age: an evaluation of an electronic service delivery project for older people in Durham Research team: Community Informatics Research and Application Unit (CIRA), University of Teeside Contact: 01642 342710 Funder: Department of Health, Social Care Group	The research investigated how statutory, voluntary and other organisations utilise Electronic Service Delivery (ESD) systems and procedures to deliver integrated services to older people. Link to more information on the FAST website (www.fastuk.org)	01/10/2003 30/09/2006

Glossary of funders:

BBSRC	Biotechnology and Biological Sciences Research Council
Department of Health, HTD	Health Technology Devices programme
Department of Health, NEAT	New and Emerging Applications of Technology programme
EPSRC	Engineering and Physical Sciences Research Council
EPSRC EQUAL	Extend Quality of Life initiative
European Commission, TEP	Transactional Exchange Programme
European Commission, FP5	Fifth Framework within Information Society Technology (IST) programme
European Commission, FP6	Sixth Framework within Information Society Technology (IST) programme
PACCIT	People at the Centre of Communications and Information Technology programme, funded by DTI EPSRC and ESRC
SPARC	Strategic Promotion of Ageing Research Capacity (SPARC) network is funded by EPSRC and BBSRC