MATCH

MOBILISING ADVANCED TECHNOLOGIES FOR CARE AT HOME

developing home care systems to support independent living

Project Manager: Louise Bellin (+44-1786 467429, leb@cs.stir.ac.uk)

Web Site: www.match-project.org.uk

About MATCH

Assistive technology helps those with disabilities cope with normal life. Specialised technology is also being used to monitor situations such as someone becoming immobile or incapable. The aim is that, through use of sophisticated networking and management software, abnormal situations can be detected and reported to a carer or a responder.

The MATCH project aims to help in a number of ways:

- maintaining the independence of those receiving social and health care at home
- improving their quality of life
- enhancing the care they receive at home
- easing the burden on their carers.

MATCH is a collaboration among the Universities of Dundee, Edinburgh, Glasgow and Stirling (lead). Each University brings different expertise to the project, and is building on existing work to develop research capacity in a number of areas. The project is supported by the Scottish Funding Council from 1st November 2005 to 31st October 2009.

Our Aims

Our overall aim is to develop a research base for advanced technologies in support of social and health care at home. This includes care at home of those with long-term illness, physical or mental impairment. The project is establishing a research infrastructure in the specific areas of home care networks, lifestyle monitoring, spoken interaction, and configurable multimodal systems.

Potential users for MATCH include older people and people with disabilities of all ages. Different questions arise for varied client groups. The project acts as a research network with sufficient multi-disciplinary coverage to explore issues in a range of needs. As examples, MATCH aims to benefit users in contexts such as:

- older and/or disabled people living in sheltered or warden-assisted housing
- older and/or disabled people living in their own dwelling, and wishing to stay there for as long as possible in order to retain their independence.

Our Objectives

Our high-level objectives are as follows:

- to create a Scottish centre of excellence in the field of technologies for home care
- to create a network of staff from academic, industrial, care and housing partners
- to develop specialised laboratories and demonstration centres for home care
- to provide specialised training and guides on home care technology
- to work effectively with existing industrial products and care practices
- to establish care models for appropriate and ethical use of the technologies.

University of Dundee – Lifestyle Modelling

The University of Dundee is exploring the value of lifestyle modelling from two perspectives:

- The lifestyle of the dwelling is being considered in terms of the 'busyness' of those associated with it. Changes in the activities taking place within the dwelling are a reflection of the busyness of the occupant(s). Detected changes can become the basis of improved information for the occupant, and can also inform the discussion between the occupants and their carers, both formal and informal.
- Specific activities are being identified as important indicators of well-being for various conditions. These activities can provide insights into health and/or social well-being of the occupant. Changes can indicate the worsening of a condition or the need for care service intervention.

University of Edinburgh – Spoken Interaction

The University of Edinburgh is focusing on speech interfaces to home care technology. This involves:

- teaching computers to recognise human speech
- creating computer voices that are easy to understand and are pleasant to listen to
- teaching computers how to interact with users in a way that is helpful, polite, and efficient.

For example, the user could operate devices such as lights, windows or alarm sensors by speaking to them. Users could also have a talking diary that reminds them of appointments in good time.

University of Glasgow – Configurable Multimodal Systems

The University of Glasgow is working on multimodal and configurable approaches to home care systems. These can use specialised devices or existing devices within the home such as phones, handheld computers, speakers, microphones and TVs. Studies are being conducted of how best to exploit a variety of interaction techniques such as touch, speech, sound and gesture. Home care systems should be able to use the best combination of these approaches in a way that is:

- effective in delivering care
- satisfying for its users
- adaptable to different contexts of use.

Investigations include the most effective ways for users to communicate multimodally (i.e. by different senses) with the home care system. This may depend on who is using the system, what they are using it for, where they are using it, and the ever-changing needs and requirements of the people using it. The potential users of a home care system include the people being cared for, the people directly involved in care, and those requiring access to the system in some way. Meeting these needs is a complex research issue, both socially and technologically.

University of Stirling – Home Networking

The University of Stirling is developing network-based solutions that can deliver health and social care to the home. One aspect of this is linking a variety of devices and appliances around the home. The philosophy is to combine simple devices in sophisticated ways. By doing this through software, it is easy to adapt to what the user needs.

A range of services is being developed for health and social care. These are supported by the industry-standard Open Services Gateway initiative. This allows a variety of services to be developed and deployed in the home over a network link. The services support care, communication, information, entertainment, security, management and monitoring. A policy-based system ensures that the wishes of all stakeholders are respected. This research is providing a common network basis for other work in the project.

Current Status

A system architecture for MATCH has been designed and continues to evolve. The key focus of this is the integration of technologies from the various Universities. Data is gathered from a set of sensors about the state of the home and its residents. This provides input to home care services that promote well-being and support management of long-term conditions. Users interact with the system in a variety of ways such as speech, graphics, audio, touch and gesture. Interaction is via devices such as special-purpose displays, ordinary digital televisions, mobile phones and home appliances. A message broker transfers information among all the system components. An interaction manager deals with how best to interact with the user. Rules for how the system should support the user are defined and executed by a policy-based management system.