

Title	Interface Design for the Elderly, Disabled and Cognitively Impaired: Experiences from the EU FP6 ICT “EASY LINE+” Project
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<p>Abstract: (Your abstract <u>must</u> use Normal style and should not be more than one side in length).</p>	<p>The European Framework 6 ICT “EASY LINE+” project has developed a range of kitchen appliances (‘white goods’), sufficiently easy to use and integrated through an adaptive ‘intelligent’ system, to allow elderly, disabled and/or cognitively impaired individuals to live longer independent lives in their own homes. The role of these intelligent devices, and the overall system, is to provide responsive help, information, advice, notifications, warnings, etc. at an appropriate level for each user, dependent on their particular ability, and flexible enough to cope with changing circumstances.</p> <p>Catering for various types of physical and cognitive disability requires considerable thought and a key component of such a system is clearly the range of interfaces through which the users interact with the system and the human-computer interaction (HMI) design of these interfaces. This paper discusses the experience gained from the EASY LINE+ project and the interface designs and design principles developed for its successful completion.</p> <p>A simple example of such an interaction is the scenario of a cooker hob being left on either with no pan on it or after a pan has been removed. The message “Hob left on with no pan” has to be conveyed to the user (wherever they may be in the home). The precise nature of the interaction and the range of options available to the user is adaptive, flexible and dependent on their level of ability, which can be assessed on a number of scales. However, the essence of the dialogue in this case would be that the user could turn off the hob remotely or respond, “Yes, I know; leave it on” (if permitted). Other scenarios include “Food has expired in the fridge”, “The washing cycle has finished”, “This food cannot be microwaved”, etc. (A variety of European languages is also supported.)</p> <p>Devices implemented to date include the television set, laptops and similar touch screen devices, digital photo frames (DPFs) and hand-held (or worn) mobile devices (MDs). The TV is seen as the central point of control in the main living room of the home, DPFs can be positioned in every room of the home for immediate notification (when not in use, they display conventional photos) and MDs can be used for emergencies and other forms of mobile interaction – in the garden, for example. HMI design must allow for a range of abilities but conform to the project’s ‘SCUF’ principles of <i>Simplicity, Consistency, Universality</i> and <i>Familiarity</i>, developed within the Interfaces workpackage of the project.</p> <p>Particular interface/HMI techniques developed in the project include:</p> <ul style="list-style-type: none"> • The standardisation of visual/tactile device interaction on the four-colour (red, green, yellow & blue) buttons of the typical TV remote-control (even on devices not associated with the TV such as DPFs, MDs, etc.) allowing complete consistency of interface design. • The use of novel software to develop multi-lingual voice output and recognition systems for the visually impaired. • The use of an <i>Ethics, Personas, Scenarios and Storyboards (EPSS)</i> development methodology to consider the needs and restrictions of all ranges of user. <p>Extensive testing of general principles and ranges of devices and interface designs has taken place in a purposely developed usability laboratory, which simulates an elderly/disabled person’s living space.</p> <p>Biography: Vic Grout is <i>Professor of Network Algorithms</i>, Director of the <i>Centre for Applied Internet Research (CAIR)</i> at Glyndŵr University, Wrexham, Wales and leader of the Interface Design Workpackage of the EU FP6 ICT “EASY LINE+” Project.</p> <p>Preferred Topic Area: 10.1. Assistive Software Technology (Human-computer interaction)</p>