

Trends in User Interfaces and the Implications for People with Disabilities

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About us

The Design School brings together the complementary strengths of Design and Technology, Ergonomics and ESRI.

This represents a significant and thriving body of activity at Loughborough, and brings together 42 academic staff, 35 researchers, 50 PhD students, 13 technical staff, and 12 administrative support staff.

The vision is of a Design School, which aims to build upon existing strengths in Design and Technology, Ergonomics and Safety research Institute (ESRI), and Ergonomics (formerly in Human Sciences) through the synergy that will come from greater interaction and co-location.

News and events

ErgoDesign 2012
Dr Ruth Sims invited to give two keynote presentations
14 November 2011

Lady Mayores' gloves
Student designs gloves for London's Lady Mayress
14 November 2011

EvoShape design software
Innovative new Computer-Aided Design application
1 November 2011

Introduction

- There are a number of developments and trends in user interfaces for consumer products and public systems.
- This talk will review them and the implications for people with disabilities, older persons and less confident users:
 - Standards and mobile keyboards
 - Trend towards touch
 - Larger and more intelligent screens
 - Bar codes and the fridge
 - Gesturing to products
 - Talking to products
 - Ambient interfaces

Standards and mobile keyboards

Stationary detachable keyboards (from ISO 9241 Part 4)

- Key strike surface 12-15mm wide by 15mm high.
- Distances between adjacent keys 18-20mm.
- 3.2mm spacing between keys.
- Pushing force ≤ 2 Newtons.
- Displacement or travel 2 to 4mm.



Mobile phone keypad recommendations for disabled users (from tiresias.org)

- Good visual contrast between the keys and body of device.
- Key tops convex or flat with raised edge.
- Keys as large as possible.
- High contrast, clear and large visual markings on the key tops.
- Ideally internally illuminated.
- Keys raised above phone body (5mm).
- Tactual indication on the '5' key.
- Pushing force 0.5 to 1 Newton.
- Auditory and tactual feedback.
- Function/numeric keys tactually discernable.

Trend towards touch – mobile phones

“Big Button Mobile Phone For Elderly OAP Persons, New Unlocked” – a functional phone but wording unlikely to attract older or visually impaired users.



Phone advertised on “Thecheaplaptopsuk” website

Trend towards touch – mobile phones

- Low vision accessibility options
 - Voiceover
 - White on black
 - Zoom



A useful demonstration of these features (for iPad) is available at:
<http://www.youtube.com/watch?v=yLSaWwbuhfc&feature=related>

Trend towards touch – good ergonomics?



Touch screen on washing machine:

 <http://www.youtube.com/watch?v=g9NYJa9HVEc&feature=relmfu>

Trend towards touch - surfaces

Touch surface at the Space Centre in Leicester



Larger and more intelligent screens

- Samsung SMART TV



Bar codes and the fridge

- Barcodes on products can be used to scan items for the smart fridge which can monitor contents and automatically add to shopping list when stocks are low.



<http://www.guardian.co.uk/lifeandstyle/2012/jan/11/homes-fooddrinks>

<http://www.youtube.com/watch?v=R3e5aBh7JUI&feature=related>

Gesturing to products



KinMINDS: http://www.youtube.com/watch?v=8qk5_gYmVvl

Talking to products

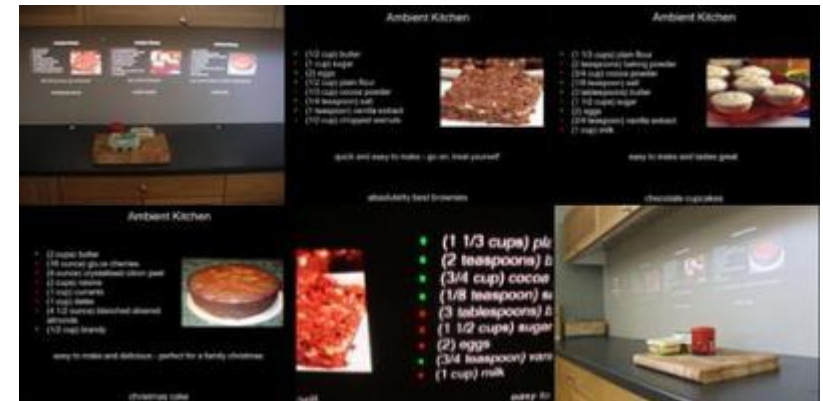


Ambient interfaces – in the kitchen

The Ambient Kitchen project set up Professor Patrick Oliver at Newcastle University is one example of a facility that is testing technological innovations in the kitchen particularly for those with cognitive impairment...



- Recipe reminder
- Medication reminder
- Situated media
- Sensor display



<http://culturelab.ncl.ac.uk/research/digital-interaction/ambient-kitchen-cels>

Ambient interfaces – near field communication

- Potential benefits for people of NFC:
 - Contactless Payment
 - Public transport payment
 - Health care smart card (providing and collecting information)
 - Ease of use (touch device to connect)
 - Smart objects providing information when passing e.g. at a tourist site at a bus stop.



Conclusions

- How can these kinds of developments fit into standards?
Issues that need to be considered are:
 - Accuracy / reliability of the new technology
 - Simplicity e.g. keeping the number of gestures or voice commands limited
 - Avoiding unwanted side effects e.g. good person-system match
- Researchers should consider some of these ergonomic requirements when reporting their technological research which can be helpful for design standards.