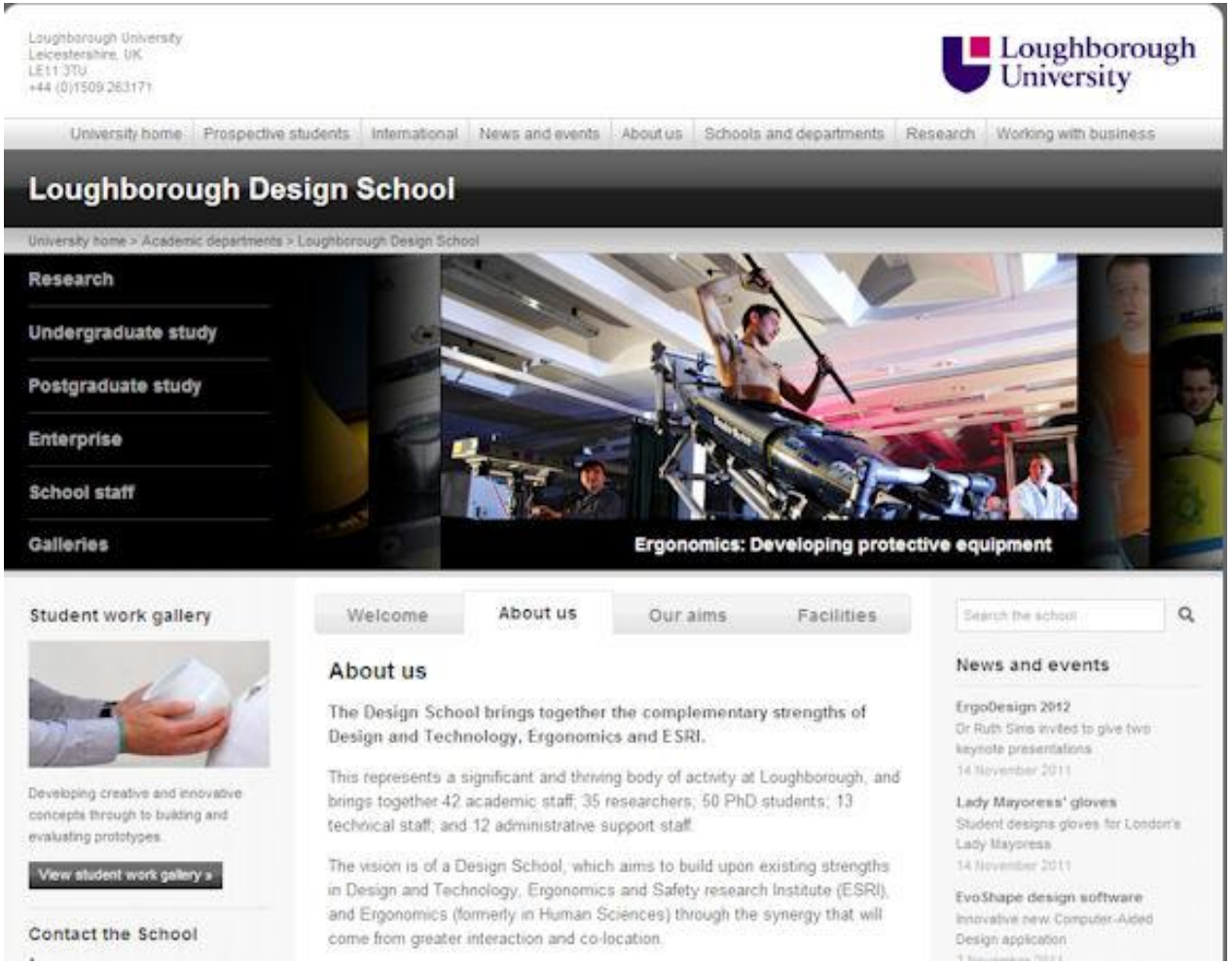
Trends in User Interfaces and the Implications for People with Disabilities

M. C. Maguire
Loughborough Design School
m.c.maguire@lboro.ac.uk

Loughborough University CARDIAC

The Loughborough Design School



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.

Loughborough University CARDIAC

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

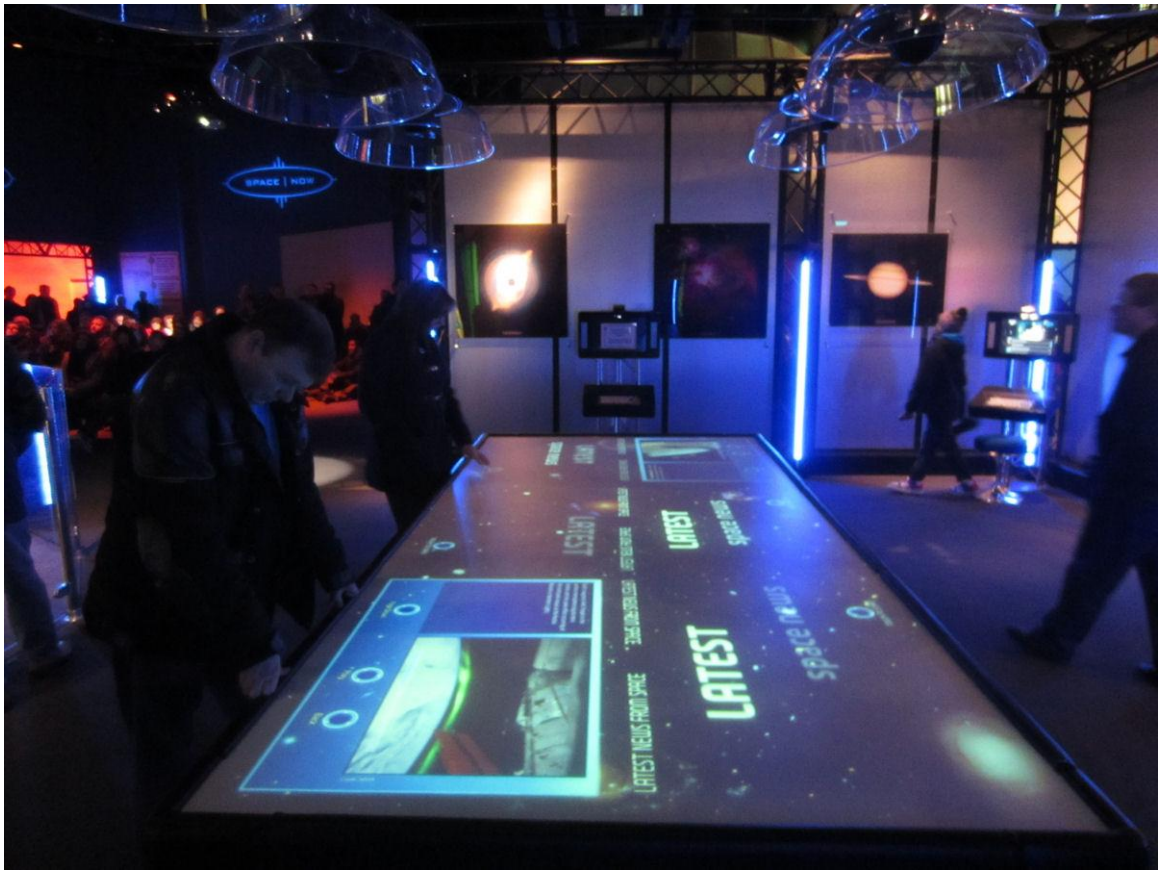
Loughborough University CARDIAC

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

http://www.youtube.com/watch?v=GAja7Nz_uUk
http://www.youtube.com/watch?v=m5rlTrdF5Cs

Loughborough University CARDIAC

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_gYmVvI

Loughborough University CARDIAC

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 commends 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.