Interactive system design

3 lecture
Activities and technologies

- Activities in contexts
- Requirements
- Opportunities
- People
- Technologies
Activities

• Temporal aspects
• Cooperation
• Complexity
• Safety-critical
• The nature of content
Activities

• Temporal aspects
  – frequency
    • Frequent tasks – easy to do
    • Infrequent tasks – easy to learn or remember how to do
  – Time pressure
    • Quiet or busy
  – Single or continuous actions
    • Can be interrupted?
      – If Yes – let user find their place
  – Acceptable response time
Activities

• Cooperation
  – One or more users?
  – For collaborative activities
    • Awareness
    • Coordination
    • Communication
Activities

• Complexity
  – Well-defined task
    • can be accomplished by step by step design
  – for a vague activity people have to be able
    • to browse around
    • see different types of information
    • move from one think to another
    • …
Activities

• Safety-critical aspects
  – any mistake could result in an injury or serious accident
  – designers must pay attention to ensuring that mistakes do not have a serious effect

• Designers must
  – think what happens when people make mistakes and errors
  – design for that circumstance
Content

• the nature of content: data requirements
  – What is input?
    • large/modest/small amount of required data?
  – How to input?
  – What is output?
    • alphanumerical data, video records, other media

• good content: accurate, up to date, relevant, good presented
Contexts

• Physical environment
  – temperature, humidity, atmospheric pressure, light levels, noise, ..

• Social environment

• Organisational environment

• Technological environment
Technologies

• Input devices
  – switches and buttons facilitate instructions
    • take up space
  – for alphanumerical input – keyboards
QWERTY keyboard

- 1868
- Christopher Latham Sholes
- solved the jams when the keys were struck
- 150 words per min
QWERTY layout

Without SHIFT
Technologies

• Input devices
  – touch screens
  – pointing devices, e.g. mouse, stylus
  – trackball
  – joystick

Microsoft surface
Technologies

• Input devices
  – trackball
  – joystick
  – gists
  – QR codes

Microsoft Kinnect
Output technologies

Flexible organic light-emitting diode

Haptic technologies

2D and 3D printers
Communication

• Between people and between devices
  – Bandwidth and speed are critical
  – wired, wireless, wifi
PEOPLE
Physical differences

• Physical characteristics: height, weight
• Senses: sight, hearing, touch, smell, taste
• Colour blindness
  – inability to distinguish red and green colours ~8%
• Short-sightedness, long-sightedness
• Many people are hearing impaired
• Dexterity impairment involving the use of fingers
Mental models

• The understanding and knowledge that is possessed of something, e.g. using IT
  – incomplete:
    • people understand some parts better than others
  – unstable
    • people can forget details
Social differences

• the reason for use technologies
• motivations to learn and use particular system
  – beginner needs to be guided
  – experts use a system regularly and learn all sortsof details
  – intermediate need to remember how to use
Scoping the problem with PACT

• Right mix
  – of technologies
  – to support activities
  – being undertaken by people
  – in different contexts
Example: access to university laboratories

• People
  – students, lecturers, technicians

• Activities
  – enter some form of security clearance and open the door

• Contexts
  – indoor activity, people may carry books, in a crowd,

• Technologies
  – small amount of data has to be entered quickly
  – the output must be clear,
  – accessible for people in wheelchairs
SOME SIGHT CHARACTERISTICS
Colour sensitivity
Blue – less sensitive

• Avoid blue texts and lines

Good background
Grey scale and colorfull

- Grey scale
  - borders
- Colorfull
  - big elements
  - attracting attention
Contrasts

- Herman grid
- Avid contracts in foreground and background
Contrast highlights borders
Warm and cold colours

Turner, The Battle of Trafalgar (1822)
Use of colours
Illusions

- Ehrenstein and Orbison Illusion
- Heringo illusion
- Jastrow illusion
- Mueller-Lyer illusion
- Zoelner illusion

http://www.brl.ntt.co.jp/IllusionForum/index.html
Ehrenstein ir Orbison illusion
Hering illusion

Jastrow Illusion

http://www.brl.ntt.co.jp/illusionForum/v/jastrow/ja/index.html
Mueller-Lyer Illusion

Zoelner illusion

Readings