Module II: Interfaces

Human-Computer Interaction
Graphical User Interfaces

Learning Goals [today] you should be able to

• explain how tools augment and constrain our power to think and act, define the “myth of human error” and give examples that dispel this myth;

• explain strengths and weaknesses of human-computer interfaces, referring to concepts such as familiarity and consistency, mappings and metaphors, feedback, negative transfer, or additional concepts that you identify

Selected RQs

Are there currently any completely different interfaces programmers are experimenting with, that are completely alien from the typical File/Edit/View interfaces in Mac [OS] and Windows? Are there people currently who are experimenting with completely getting rid of toolbars, scrollbars, etc.?

Selected RQs

Does a metaphor simply refer to an easy to interpret interface? For example, + and - implicitly denote an increase or decrease (most commonly in volume).

In this sense, a software metaphor is almost the opposite of a literary metaphor; it stands as exactly what you would expect, and serves that single purpose. Is this a correct assumption?
Selected RQs

(Not a question, but an interesting observation:)

• The power button on nearly every electronic device is a circle with a vertical line inside, the eject symbol is always a horizontal line below an upward pointing arrow. All of these examples have become natural instinct to most of my generation, across the globe.

(submitted by Chris, 2011W1)

Clicker question

• Chris’s observation is an illustration of

(A) Feedback   (C) Form follows function
(B) Watching others   (D) Consistency

Selected RQs

• Unix is a text base interface. Can you evoke GUI based programs with Unix commands. For example can you open internet on a Unix operating system?

• If a text-based interface turned out handy sometimes why do Apple and Microsoft not have a text based operating system? Or is there a possibility to control windows only with written commands?

(submitted by Anne-Sophie)

Administrative Question

• Do we have to know specifically how to use UNIX for the final exam, while the concept was not covered much both in the module or the lab?

Answer: Anything that was covered in any component of the course (lab, reading, class, ...) is relevant for your exams. Unix was covered in Lab 0 and in the reading for Module 2, so it is definitely relevant.
Tools and Interfaces

• tools *augment* our power to think (and act)
  – example: tools for visualization of phylogenetic trees

• tools *constrain* our power to think (and act)
  – example: Roman number system:
    | I   | II  | III | IV  | V   | VI  | VII | VIII | IX  | X   | XI  | ...
    | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | 10  | 11  |
    – M: 1000  D: 500  C: 100  L: 50  X: 10  V: 5  I: 1
    – (try multiplying MMMCMXCIX * MMMCMLIV)

The Myth of Human Error

• myth: faulty use of technology is usually the result of human error

• fact: many so-called human errors are actually errors in design

The Myth of Human Error

• deeper understanding of human physiology and psychology is changing the ways that digital interfaces are designed

• example: Ron Rensink’s work on change blindness
  www.psych.ubc.ca/~rensink

Clicker question

The clicking sound of a virtual keyboard is an example of …

(A) familiarity and consistency
(B) well chosen mappings and metaphors
(C) providing useful feedback
(D) managing complexity
Clicker question

Which burner does the blue knob control?

The left layout is superior because it follows the principle of:
(A) familiarity and consistency
(B) well chosen mappings and metaphors
(C) providing useful feedback
(D) managing complexity

Clicker question

The hierarchical organization of menus and the ability to hide features that are not of interest are examples of …

(A) familiarity and consistency
(B) well chosen mappings and metaphors
(C) providing useful feedback
(D) managing complexity

Clicker question

• On which side does this door open?

• which status light indicates ok to proceed?

These examples illustrate:
(A) familiarity and consistency
(B) well chosen mappings and metaphors
(C) providing useful feedback
(D) managing complexity

Selected RQs

Will a tool or program ever reach its limit? E.g., will we ever get a "perfect" iTunes?

Interfaces in communication have changed drastically in the past (e.g.: telegraph, telephone, internet). Is this the pinnacle of our communication and will all innovation cease in this field, or will there be a better, more efficient way to communicate in the future?
HCI research @ UBC

involves researchers from CS, Psychology, Commerce, Forest Resource Management and Engineering - see, e.g.:

– D’Groove (digital haptic turntable):
  www.cs.ubc.ca/labs/spin/projects/dgroove/

– “Multi-Layered Interfaces to Improve Older Adults’ Initial Learnability of Mobile Applications”
  http://dl.acm.org/citation.cfm?doid=1838562.1838563

Food for Thought

“… enjoy yourself. Walk around the world examining the details of design. Take pride in the little details that help… Give mental prizes to those who practice good design: send flowers. Boos to those who don’t: send weeds.”

– Donald A. Norman

Exercise (homework, not collected)

• Explain strengths and weaknesses of human-computer interfaces, referring to concepts such as familiarity and consistency, mappings and metaphors, feedback, negative transfer, or additional concepts that you identify

• Try this for Mapquest (www.mapquest.com) and CycleVancouver (www.cyclevancouver.ubc.ca)

• Use whole sentences! Provide concrete examples to illustrate your points.

Module II: Interfaces

Text-based Interfaces
Human Computer Interaction (HCI)

history in one slide

- The early days
- Punched cards
- Terminals and keyboards
  - text based interfaces

- The mouse
  - graphical user interfaces
  … but text is still important!
Learning Goal

you should be able to

• use basic features of text-based interfaces such as Unix or search engines, with knowledge of the ways that special symbols are interpreted (or misinterpreted) by such interfaces.

Unix

• operating system deployed in the early 1970s to enable real-time sharing of computing resources among multiple users and tasks
• supports purely text-based commands to act on data

Selected RQs

It is said that the text-based interface (TBI) can be quick to type and is convenient for people who have visual impairments or who have difficulty in controlling a mouse.

But for me, I still think GUI is really better than TBI since it is really easy to use GUI rather than having to remember those commands in TBI. Why do some experts still prefer to use TBI? Is there any other significant advantage of TBI?

Clicker question

navigating directories in Unix

The special directory name ~ refers to

(A) the current directory
(B) the current directory’s parent directory
(C) the current user’s home directory
(D) the root directory of the file system
The special directory name . refers to

(A) the current directory
(B) the current directory’s parent directory
(C) the current user’s home directory
(D) the root directory of the file system