

Fundamentals of Human-Computer Interaction



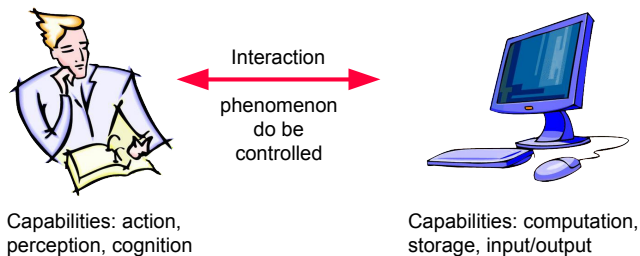
Michel Beaudouin-Lafon
Université Paris-Sud
mbl@lri.fr

Master Informatique - Université Paris-Sud

Outline

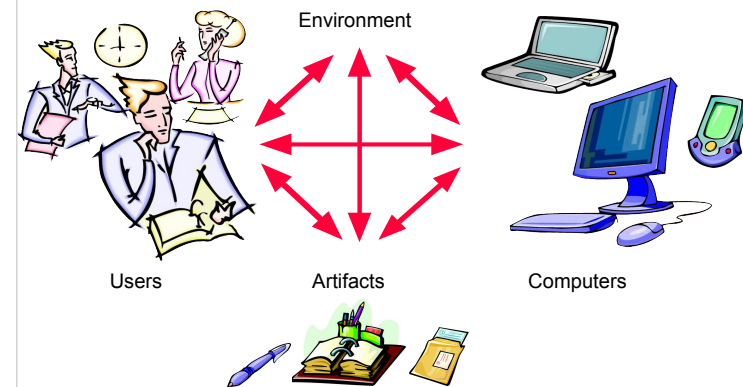
- Introduction
- Psychology 101
- Graphical interaction
- Engineering of interactive systems
- Post-WIMP interaction
- Conceptual design
- Theories and models of interaction
- Groupware and cooperative systems

Human-Computer Interaction



Environment: physical, social,
organisational, cultural, etc.

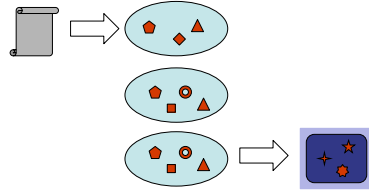
In the real world: *Situated Interaction*



An interactive system is not ...

An algorithmic system that:


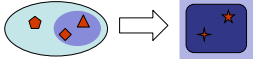
- Reads input
- Processes it
- Writes results

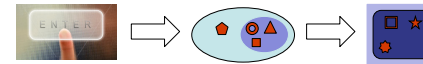


See Wegner, *Interaction is more powerful than algorithm*

An interactive system is ...

A computer system that:

- Holds an internal state 
- Creates perceivable representations of part of this state 
- Reacts to input as soon as it arrives



Two properties of interactive systems

Reactive:

- U provides input to S,
- S must process it immediately and generate output to U

Open:

- dependencies between S's output
- and U's future input are unknown to S

Asymmetry:

- U does not have to react immediately to S
- U likes to know the dependencies between S's input and output

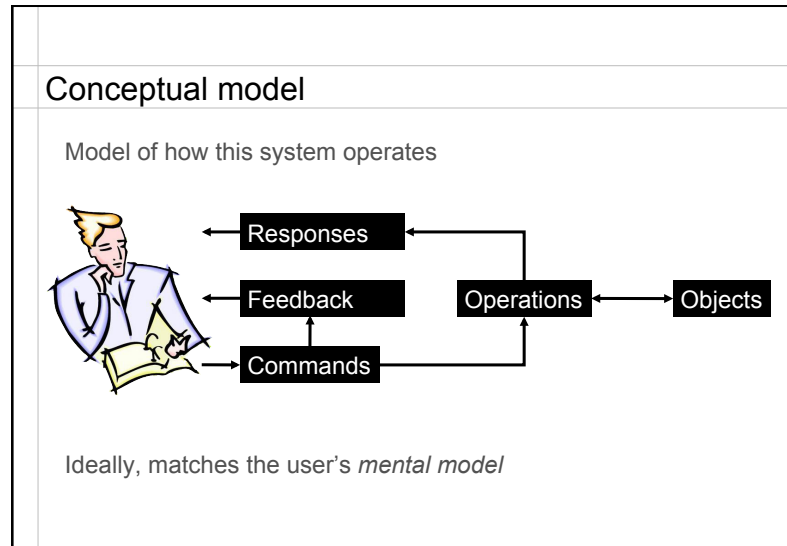
Two conceptions of human-computer systems

« human-in-the-loop »

- System-centric view where the user must conform to the system's rules, e.g. provide input in a specific order or format
- Addresses operational tasks where the user performs actions that the computer cannot (yet) do

« computer-in-the-loop »

- Human-centric view where the computer must be adapted to the capabilities of the user
- Addresses creative tasks where the computer extends or augments the capabilities of the user



BEWARE!

We all use interactive systems
 We all have ideas of how to improve them
 ... But few are designers or HCI researchers

Paradox of Human-Computer Interaction (HCI):
 Measure of success = invisibility, transparency
Making things simple is difficult (and difficult to understand)

Adaptability of humans is a strength ... and a weakness

⇒ HCI is a complex multidisciplinary domain
 ⇒ Design and HCI research require unique skills

Research in Human-Computer Interaction

It is **NOT**:

- Using interactive systems
- Developing interactive systems
- Designing interactive systems

It can be:

- Understanding interaction as a natural phenomenon
- Invent and evaluate novel interaction techniques
- Create tools for the development of interactive systems
- Develop methods for the design of interactive systems

Critical thinking and rigorous methods

