UXD: User Centered Design

Dr Benjamin Cowan

Lecture 1 - What is HCI?

https://www.youtube.com/watch?v=IMe032S9krc

Why we are all here???

A bit about me

Lecturer at ICS

Interested in researching People & Technology

Specifically:

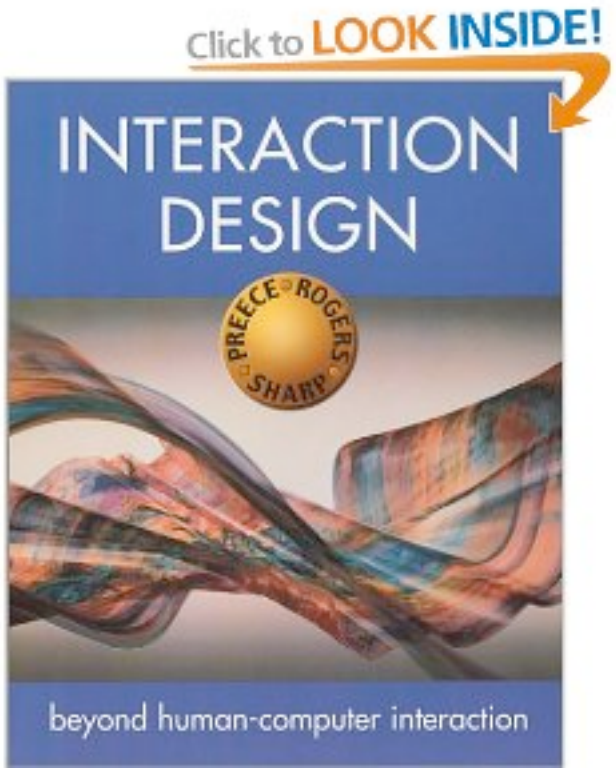
- Speech Interfaces

Ground-rules

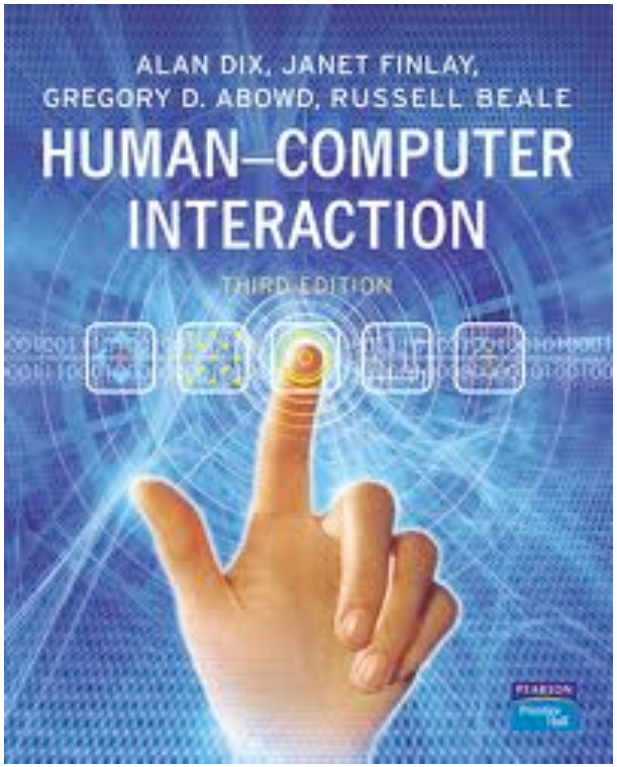
- Do the course readings
- Not everything is covered
  - Read around the area & main texts
- No such thing as a stupid question

Course texts and resources

Interaction Design



Human Computer Interaction



Texts and Resources

Repository for key papers:

- ACM Digital Library

Key conferences:

- ACM CHI; NordiCHI; BCS HCI; Interact

Key Journals:

- HCI, IJHCS, IwC, CIHB

Lecture Overview:

- What is HCI?
- What constitutes the field of HCI?
- Why is it important?
- What jobs or businesses relate to HCI?
- Design and why is it important?
- What is Usability?
- History of HCI
- Discussion

Human-Computer Interaction

WHAT??????

Human

What makes us human?

Human

What makes us human?

- *Compared to other living creatures?*
- *Compared to Computers?*
- *AI?*

Computer

What is a computer?

Computer

How many computers are in your house?

With thanks to Alan Dix - http://hcicourse.com/

Definition

"An electronic device which is capable of ***receiving information (data)*** *in a particular form and of* ***performing a sequence of operations in accordance*** *with a predetermined but variable set of procedural instructions (program)* ***to produce a result in the form of information or signals****".*

Oxford English Dictionary

Computer

How many computers are in your house?

With thanks to Alan Dix - http://hcicourse.com/

Interaction

List all the technology you use in a typical day

Discuss your views of these technologies with your neighbour for 5 minutes

Interaction

What do you like about these technologies?

What don’t you like about these technologies?

Examples:

- Why Can't I get the wifi to work?
- Trying to set up your digital camera?
- Can't understand Banking website?

How much time does the average person spend on such issues?

Multiply this by every person and multiple by hour, day, year.

Cost to business, economy, people's personal and social lives etc…..

The core of HCI

The core of HCI

YOU

Human Computer Interaction (HCI) is…..

"…the study of situations involving people and technology…..the design practices involved in such situations, and the tools and techniques that are or can be used in either"

(Dix, 2010, p.16)

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Usability

Information Visualisation

UX

HCI is....

HCI Theory/ Interaction Science

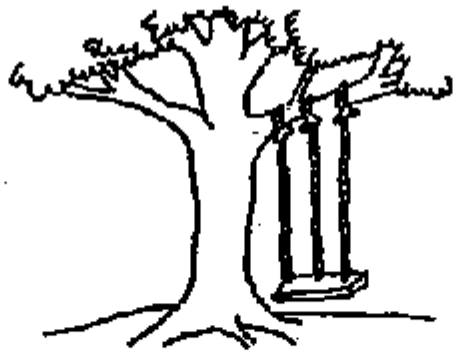
User Centred Design

Accessibility

Multimodal Interaction

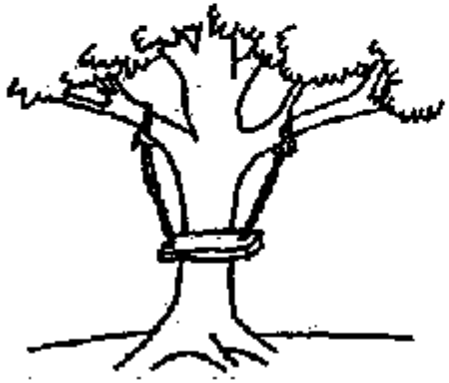
….and much more

As proposed by the project sponsor.



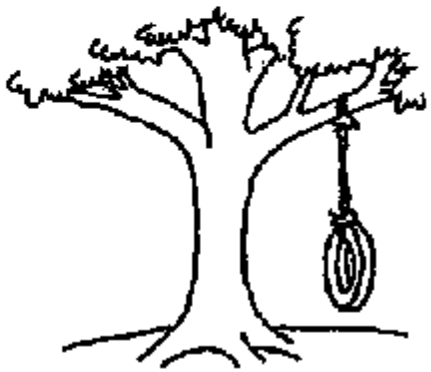
As specified in the project request.

As designed by the senior analyst.



As produced by the programmers.

As installed at the user's site.



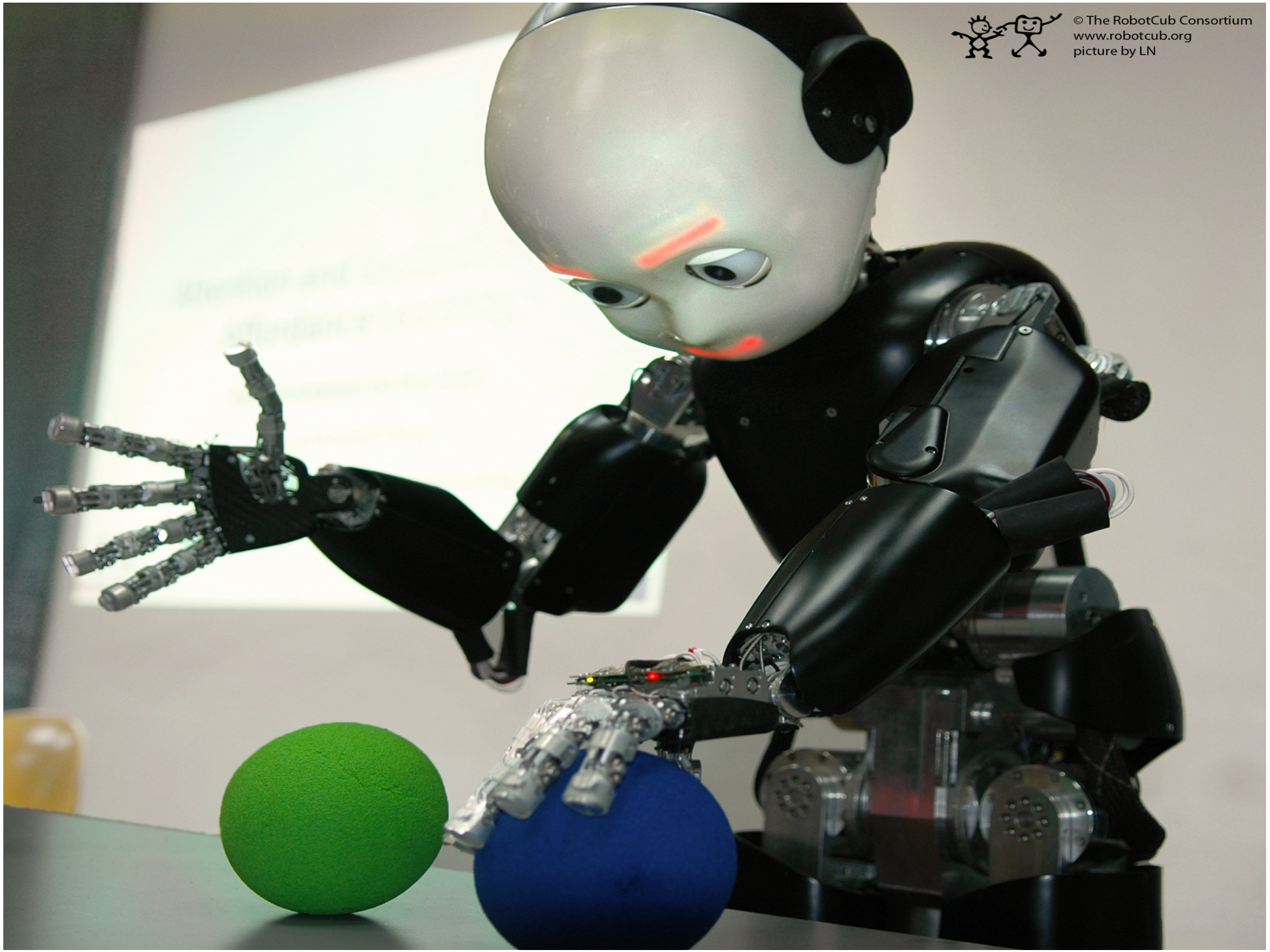
What the user wanted.

Why is it important?

http://en.wikipedia.org/wiki/Infusion_pump#Safety_issues


AUTO PILOT ENGAGE
VHF NAV
FLAP


Beam
Muirton Control & Automation Ltd
No1 Heating Tank Temperature Controller
No2 Heating Tank Temperature Controller
Mashing Flowrate Controller V7
No 1 Heating Tank Contents
No 2 Heating Tank Contents
Worts flow rate Controller V50
Mashing Temperature Controller V9
Sparge Temperature Indicator
Worts Temperature Controller V28
EMERGENCY
BEAM
mauri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picture by LN

HCI related jobs

Usability Consultant

UX Designer

Information Architect

User Interface Researcher

Usability Engineer

User Interface Designer

User Interaction Designer

Who values HCI?

Design is important

Bad design is everywhere!

Good and Bad Design

(a)

(b)

The Good

- Tivo Remote (Remote a)
  - Designed with the user
  - Buttons are large & clearly labelled
  - Logically arranged
  - Easy to use in conjunction with TV menu interfa
  - Colourful => easy for using in the dark
  - Ergomically well designed

The Bad & The Ugly

- Remote b
  - Small buttons
  - Function overload
  - Bad function mapping
    - Multiple functions

    for each button
  - Ugly

Context Context Context

Usability is the cornerstone of HCI

Usability definition

"*The extent to which a* ***system, product or service*** *can be used by* ***specified users*** *to achieve* ***specified goals*** *with* ***effectiveness***, ***efficiency*** *and* ***satisfaction*** *in a* ***specified context*** *of use.*"

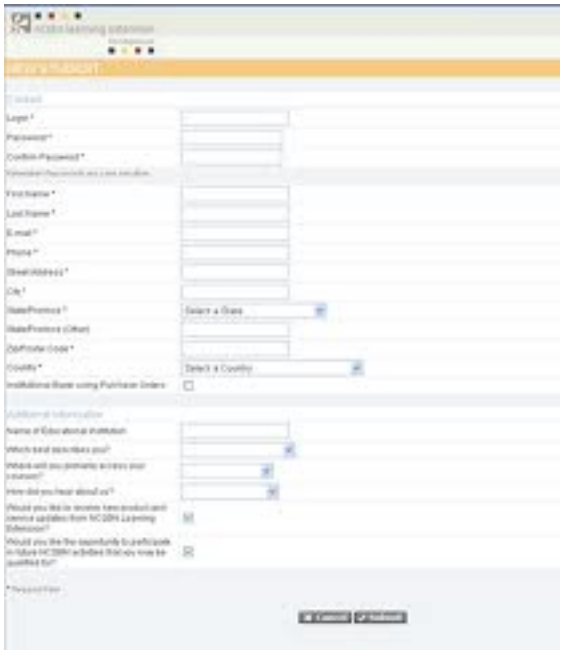
ISO FDIS 9241-210

User, context, and task

User, context, and task

Efficiency

VS



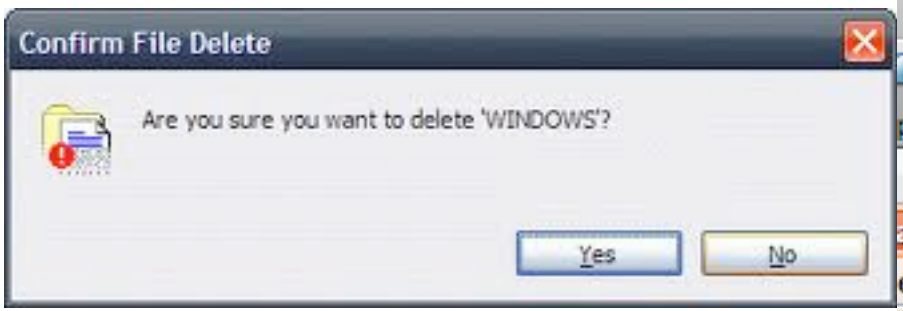
Effectiveness and Satisfaction

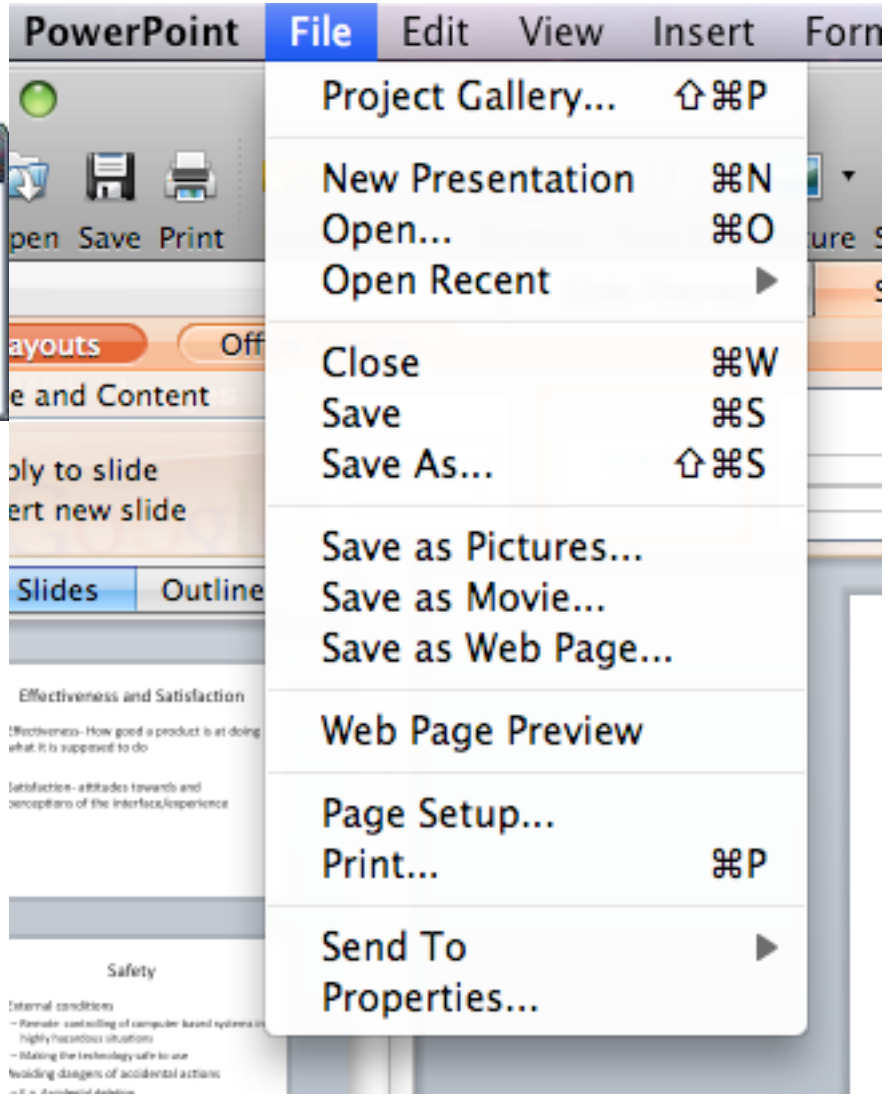
- Effectiveness- How good a product is at doing what it is supposed to do
- Satisfaction- attitudes towards and perceptions of the interface/experience
- These make up the concept of *usability*

Safety

- External conditions
  - Remote controlling of computer based systems in highly hazardous situations
  - Making the technology safe to use
- Avoiding dangers of accidental actions
  - E.g. Accidental deletion
  - Providing users with undo mechanisms
  - Interaction should feel safe to explore

Common Safety Measures





Utility

- Allowing the user to do what they want to do
- Needs the right functionality
- Low utility example
  - Drawing tool with no free hand drawing function
  - Word package with ineffective cut and paste

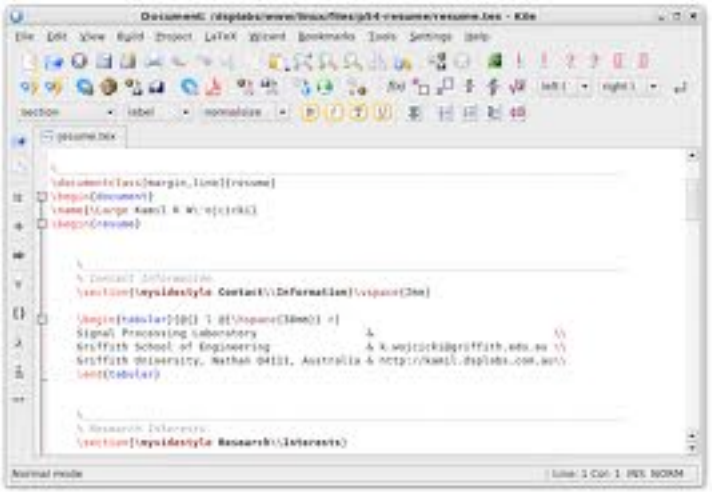

htc
13:37
People
Spotify
Evernote
Calendar
Sun 9

Learnability

- How easy is it to learn how to use
- Dependent on type of use
  - Everyday or infrequent
  - Worthwhile complexity and functionality for user

Learnability

LaTeX Editor



Word Processor

Memorability

- Once learned, how easy it is to use
- Important in infrequent interactive product interactions

…..Yet it is more than just usability

More than just usability

- Usability & HCI are not interchangeable
  - Outdated on its own
  - Highlights HCI as purely vocational
  - Usability is subset of a wider discipline

More than just usability

- Performance not be the sole criterion
- Attitudinal may be more valid
- Positive user experience
  - Fun, engaging, enjoyable
  - Interface as well as wider system experience
- Designing *for* a user experience

Historical perspectives on HCI

“…….if there were a half dozen large computers…. this would take care of all requirements we had throughout the country.”

Howard Aiken (1952)

"There is no reason anyone would want a computer in their home."

Ken Olson (1977)

What it used to be like….

https://www.youtube.com/watch?v=X4l0zvcDixo

User evolution

- Initially computers were used by
  - Specialists
  - Scientists

- With the growth of personal computers (80's)
  - Non specialists
  - Everyday people

Shift in focus

1980's

- 1 user, 1 machine/terminal

Late 1980/90's

- CSCW- networked/remote computing
- Office work

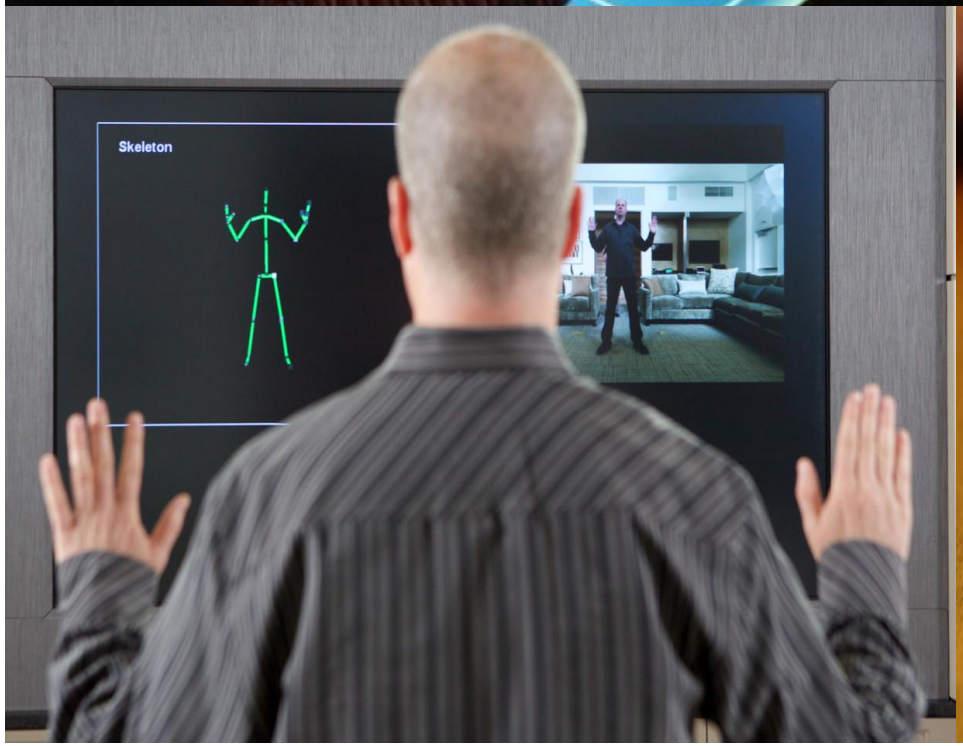
Now

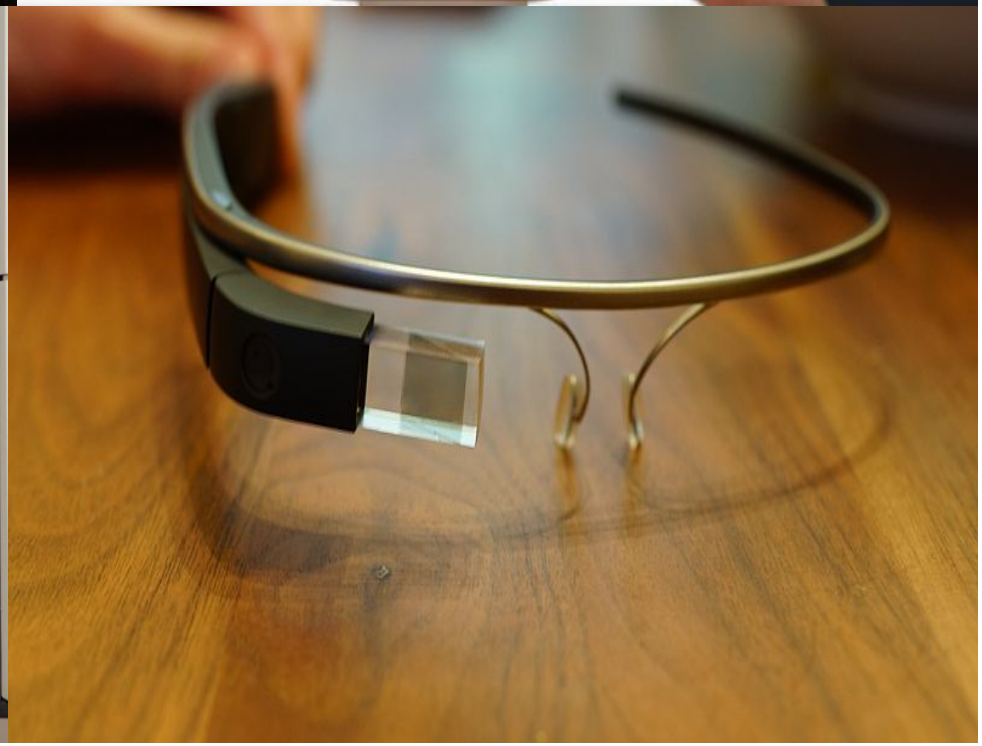
- In the home, ubiquitous, global


TeleVideo

http://old.sigchi.org/sigchi/photohistory/b-other%20hci/c485%20-%20loughburough%20-%20shackel,%20brian/

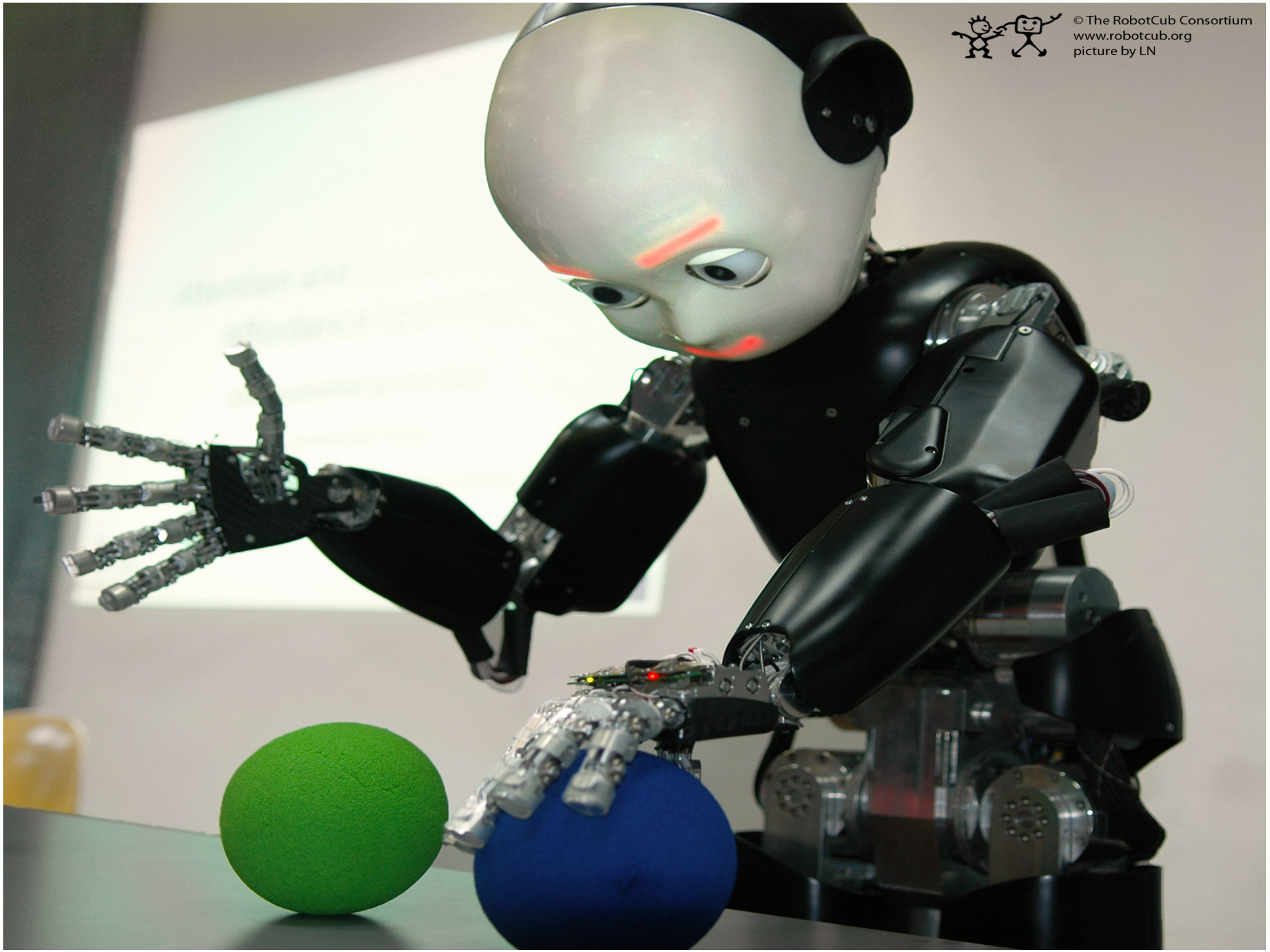
"The new users are such people as managers, physicians, lawyers, librarians, and scientists who are committed to their tasks and will only use computers if they are appropriate, useful, and usable……designing must start with the end-users and be user-centered around them" (Brian Shackel, 1997)


Skeleton



'She has a name': Amazon's Alexa is a sleeper hit, with serious superfans

The always-on Amazon Echo is developing a personality among early adopters who say they aren't worried about privacy, and welcome a listening ear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VGO

Changing perspectives

Early years

- Engineering & Human Factors, Cognitive Science, Experimental Psychology

Usability movement

- Focus on assessment & measurement of efficiency, effectiveness and satisfaction

From Empiricism to Social Science

- Shift to ethno-methodology & craft, emotion in interaction (UX)

Waves of HCI

First Wave

- Engineering & Human factors
- Ergonomics
- Atheoretical
- Interaction = man + machine
- Optimize interaction
- Pragmatic solutions to problems
- Objective measures

Waves of HCI

Second Wave

- Mind as information processor
- Rational users
- Cognitive Science/ Psychological view
- How does design support/ affect user as processor
- Generalisable
- Objective
- Theory driven

Waves of HCI

Third Wave

- Ubiquitous computing
- User Experience
- Learning or creativity
- Non task oriented computing
- Ethnographic, context specific, participant driven
- Social orientation
- Embodiment

Craft, Applied Science or Engineering?

- **HCI as Craft**
  - knowledge by practice & example
  - experiential in focus
  - neither explicit nor formal
  - Uses heuristics & successes to inform design

Craft, Applied Science or Engineering?

HCI as Applied science

- solves *general* problems by hypothesis & test
- develops explicit and formal knowledge
- More correct, complete & coherent than using heuristics & common sense
- Can lack specific design outcomes

Craft, Applied Science or Engineering?

HCI as Engineering

- Specifications of designs before implementation.
- A vs B on specific dimension
- Atheoretical

Research & Practice

- HCI Professionals
  - Concerned with designing, evaluating and transforming user centred tech product/experiences

- HCI Research
  - Understanding what it means to interact with tech
  - Understanding what it means to design interactions

Readings

- Rogers, Preece & Sharp (2011) Interaction Design: 4th Edition- Chapter 1
- Dix, A. (2010). Human-computer interaction: A stable discipline, a nascent science, and the growth of the long tail. *Interacting with Computers*, *22*, 13–27.
- Long, J., & Dowell, J. (1989). Conceptions of the discipline of HCI: Craft, Applied Science, and Engineering. In *People and Computers V; Proceedings of the Fifth Conference of the BCS HCI SIG* (pp. 1–23). Nottingham, UK: Cambridge University Press.
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- Harrison, S., Tatar, D., & Sengers, P. (2007). The three paradigms of HCI. Proceedings of CHI 2007.