CS4826

HCI - Human Computer Interaction

Module Outline

- Lectures: Luigina Ciolfi
- Tutorials (starting Week 2): Marc McLoughlin
- Exam + Project in 2 assignments

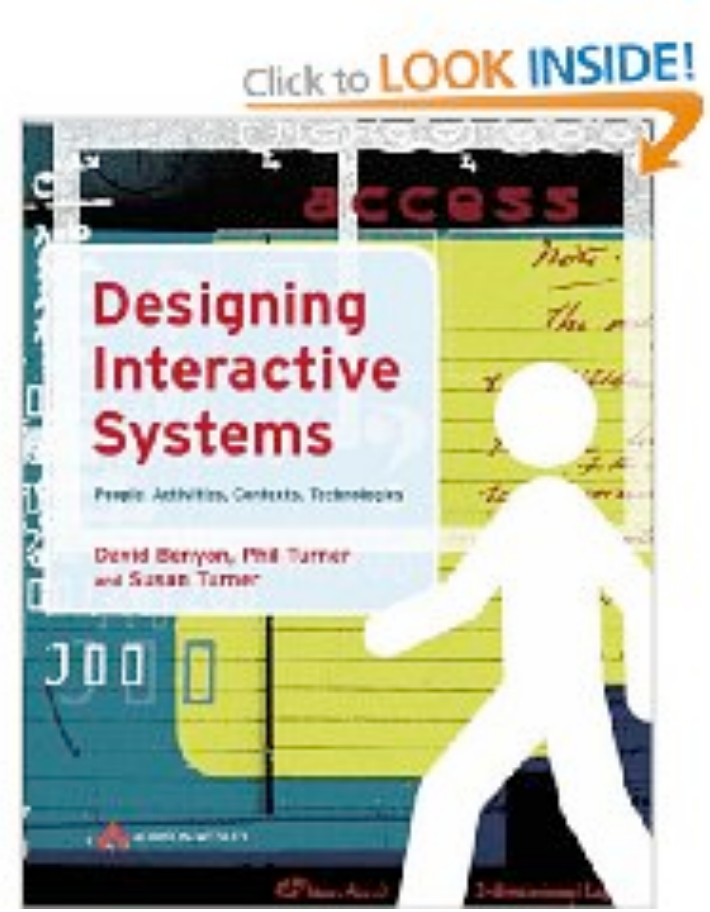
Assessment

- Exam 60%, Essay Questions
- Group Project 40%: HCI issues around a particular device/system.
- 2 Assignments: Assignment 1 is briefed in Week 4, due Week 7. Assignment 2 is briefed in Week 9, due Week 12.

Textbook

Designing Interactive Systems

by David Benyon, Phil Turner, Susan Turner. Addison Wesley 2004



What is HCI?

Human-computer interaction is a discipline concerned with the design, evaluation and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.

(Definition by ACM, Association for Computing Machinery)

Professional HCI

- Since the 1980s, HCI is an established **academic** discipline and a **professional** community
- **ACM SIGCHI**, “the ACM's Special Interest Group on Computer-Human Interaction, brings together people working on the design, evaluation, implementation, and study of interactive computing systems for human use. ACM SIGCHI provides an international, interdisciplinary forum for the exchange of ideas about the field of human-computer interaction (HCI).”
- CHI Conference Series
- http://www.sigchi.org/

Professional HCI

- IFIP, International Federation for Information Processing: is the leading multinational, apolitical organization in Information & Communications Technologies and Sciences; represents IT Societies from 56 countries or regions, covering all 5 continents with a total membership of over half a million;
- IFIP TC 13 (Technical Committee on Human-Computer Interaction)
- INTERACT Conference Series

Professional HCI

- British Computer Society, Specialist Group in Human Computer Interaction
- http://www.bcs-hci.org.uk/
- Founded in 1984, Interaction is a specialist HCI group of the British Computer Society (BCS). It provides an organisation for all those working on human-computer interaction - the analysis, design, implementation and evaluation of technologies for human use.
- HCI Conference Series

Professional HCI

In Ireland:

- The Irish Computer Society, working group on HCI

- SIGCHI Ireland: http://sigchi.cs.tcd.ie/SIGCHI_Ireland/SIGCHI_Ireland/SIGCHI_Ireland.html

- iHCI Conference Series

The focus of HCI

An example from the real world…

http://ie.youtube.com/watch?v=_TNN9xV2MkI

The focus of HCI

The notion of User

The notion of Interactive System

The notions of Interaction and Interface

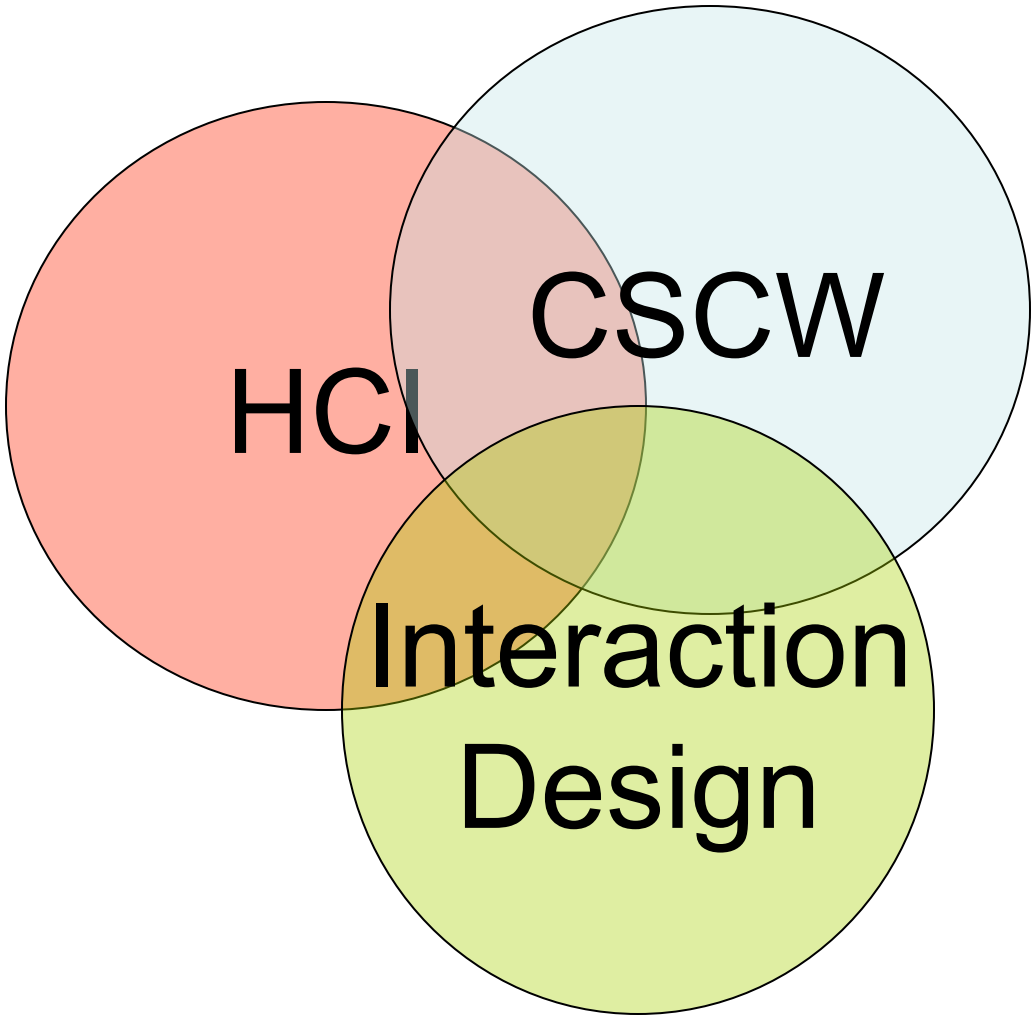
Principles for evaluation and design of interfaces

Usability standards and guidelines

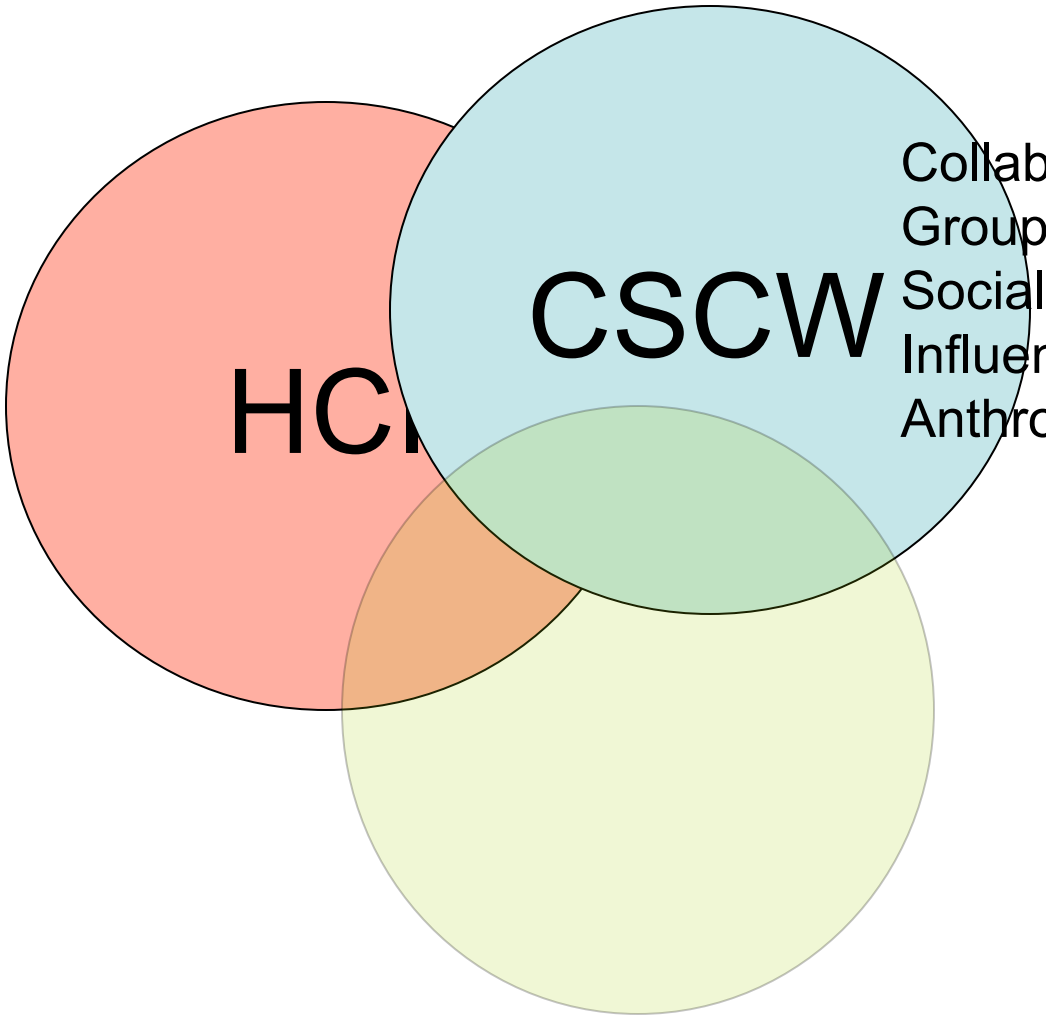
Why HCI is important

- You are all (more or less experienced) "users" of systems: important to understand how *use* and *interaction* take place
- You are designers and/or developers: important to understand not only the technical issues involved in, but also how our designs impact on stakeholders – other people
- HCI and usability guidelines are a requirement in the professional world, you might end up not doing HCI work yourself, but most likely you will collaborating with someone who does
- A lot of you will be doing HCI-related work at some point

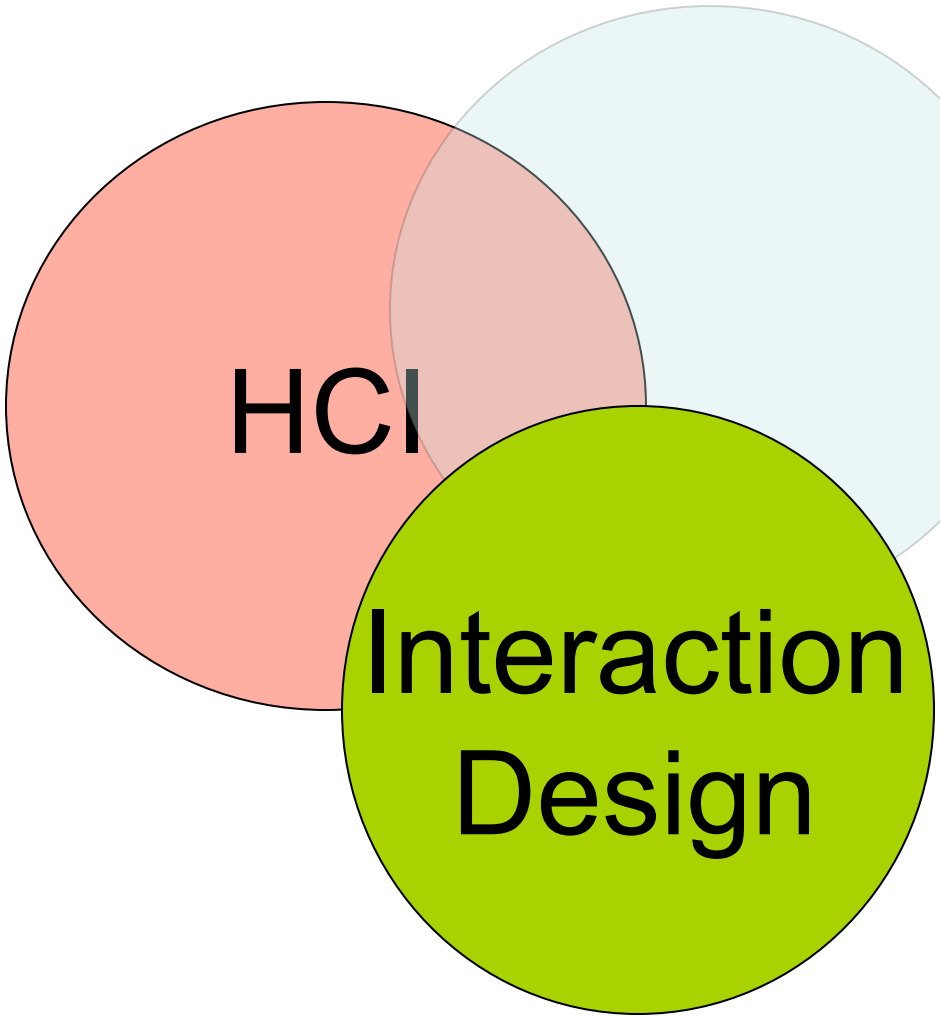
HCI and Related Disciplines



HCI and Related Disciplines

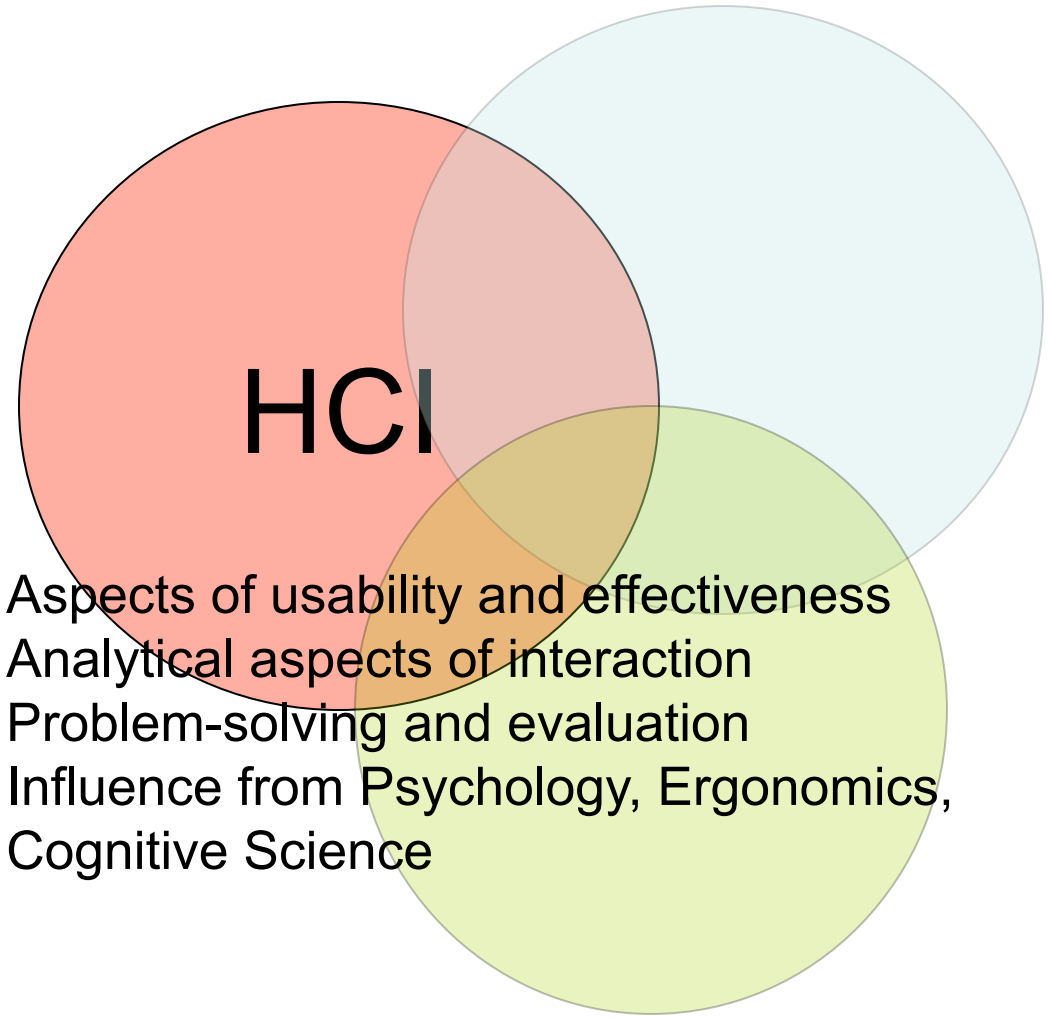


HCI and Related Disciplines



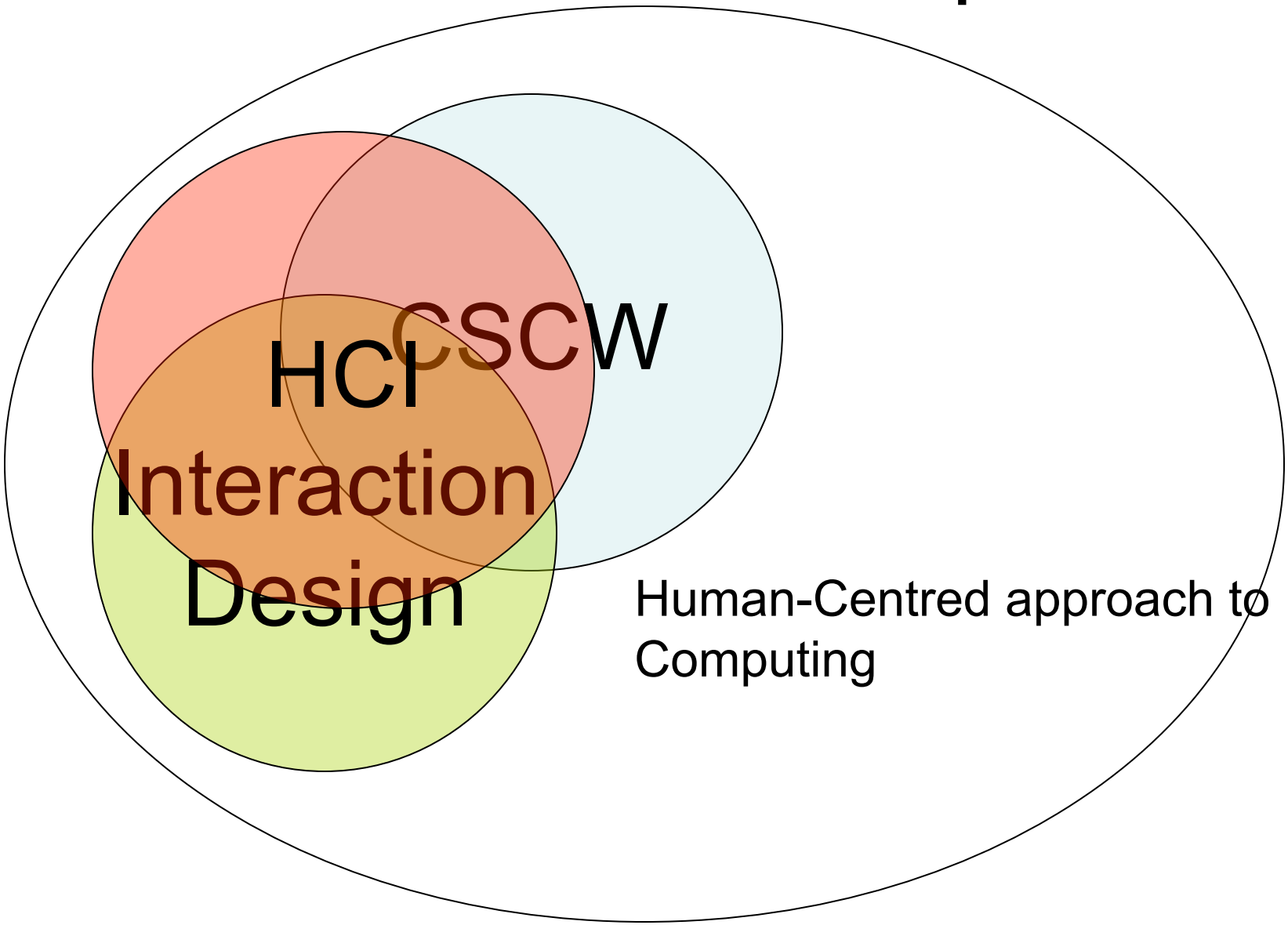
Creative aspects of technology design
User engagement, user experience
Aesthetics in interaction
Influence from Design Displines

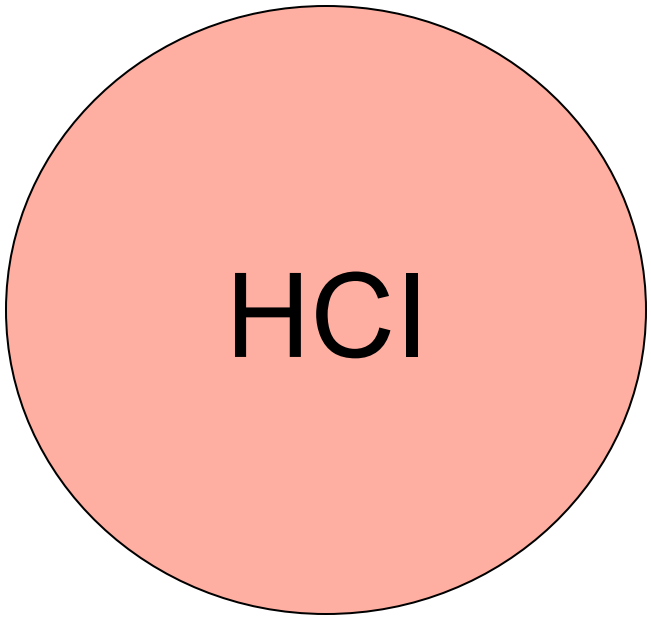
HCI and Related Disciplines



Aspects of usability and effectiveness
Analytical aspects of interaction
Problem-solving and evaluation
Influence from Psychology, Ergonomics, Cognitive Science

HCI and Related Disciplines




HCI

Interaction and **interfaces**.

What is an interface?

Anything that connects user and device, anything that offers itself up for interaction…

…Physical interface – the computer's graphical interface- etc.

The interface is the point of contact between users and systems, and what users rely on to plan their interactions: good interface design=good interactions

Interaction and interfaces.

Interaction is the dialogue between a system and the user

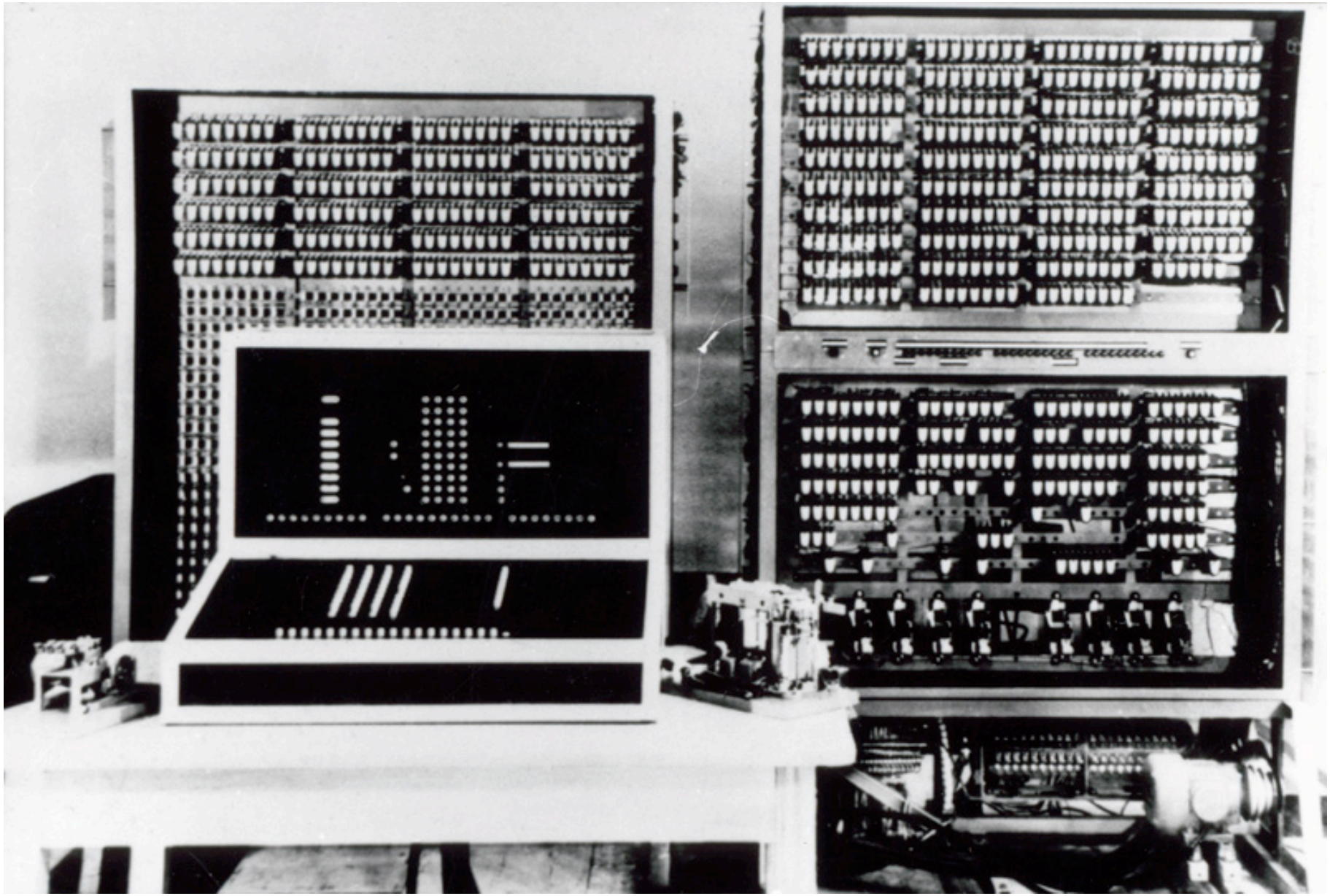
Tasks/activities: doing things through a sequence of steps (pressing a button, clicking on a link, touching the screen, etc.)

Planning of tasks and activities

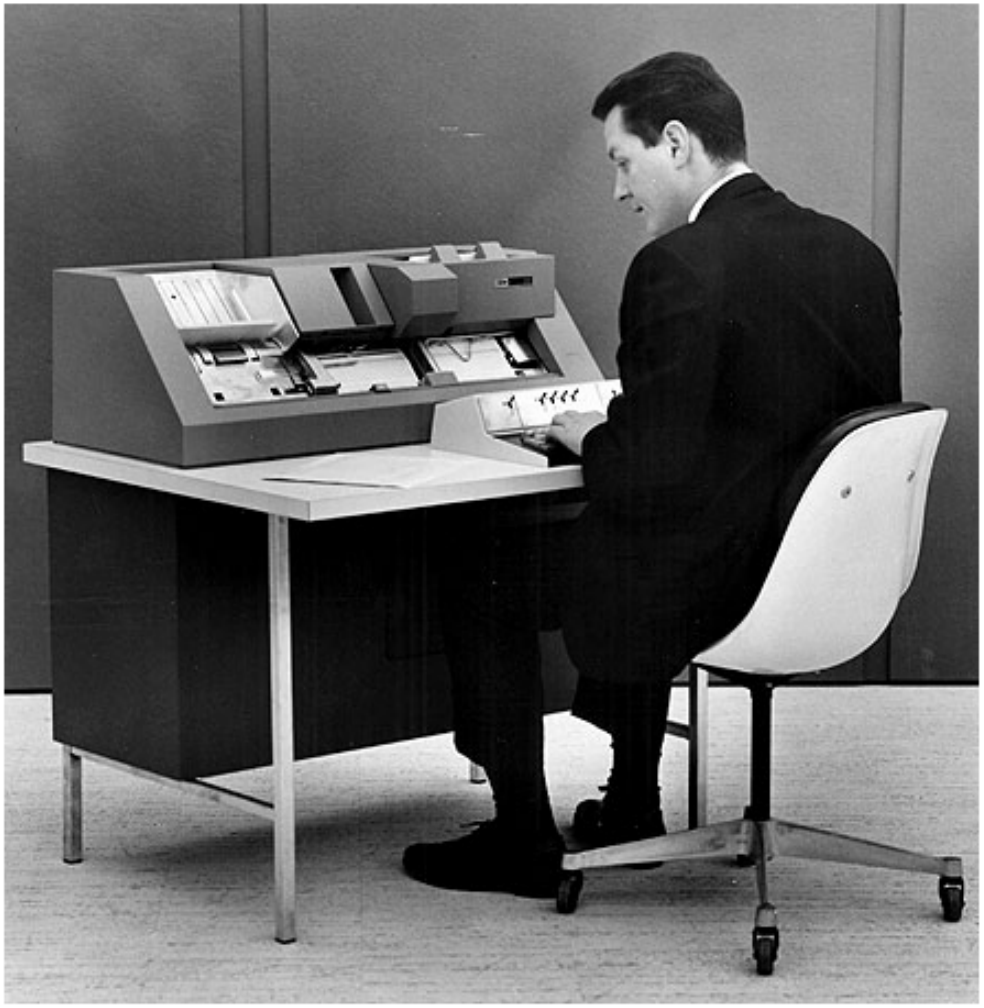
Reacting to the system's Responses

Elements from context (e.g. noise, other people, time contraints, etc)

Interaction is more than tasks!

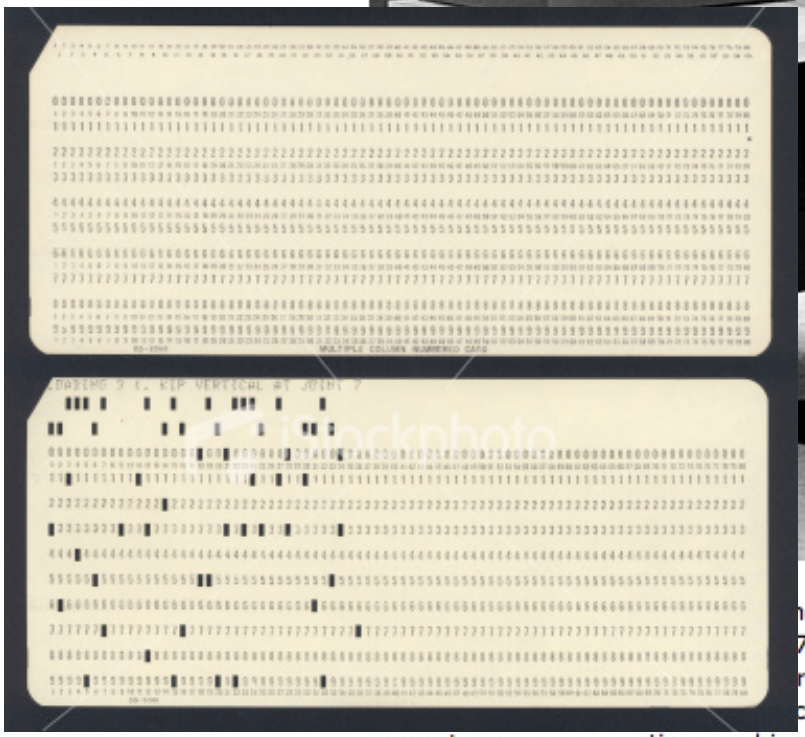


IBM 29 card punch



The IBM 29 card punch was announced on October 14, 1964, the newest version of a device first developed 74 years earlier. The punch and its companion, the IBM 59 card verifier, were used to record and check information in punched cards. The cards were then read and processed by a computer or an accounting machine. The IBM 29 remained in the product catalog until May 1984. (VV4002)

IBM 29 card punch



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History of Human-Computer Interaction Technology

Direct Manipulation of graphical objects. Where visible objects on the screen are directly manipulated with a pointing device. **Ivan Sutherland** in Sketchpad,1963 MIT PhD thesis. Manipulation of objects using a light-pen, including grabbing objects, moving them, changing size, and using constraints

http://www.youtube.com/watch?v=BKM3CmRqK2o&feature=related

History of Human-Computer Interaction Technology

David Canfield Smith coined the term **"icons"** in his thesis in 1975

A graphical object “standing in” for an application, a document or any other process/digital object in the systems

Interaction with the icon is more straightforward that interaction with the system files

History of Human-Computer Interaction Technology

The **mouse**, Stanford Research Laboratory (now SRI) in 1965 (cheap replacement for light-pens, which had been used at least since 1954).
Many of the current uses of the mouse were demonstrated by **Doug Engelbart** as part of NLS in a movie created in 1968.
The mouse was then made famous as a practical input device by **Xerox PARC** in the 1970's. First appeared commercially as part of the Xerox Star (1981), the Three Rivers Computer Company's PERQ (1981), the Apple Lisa (1982), and Apple Macintosh (1984).

http://ie.youtube.com/watch?v=1MPJZ6M52dI
http://ie.youtube.com/watch?v=pKZtJ-UCMOY&feature=related

Windows: Multiple tiled windows were demonstrated in Engelbart's prototype NLS in 1968. **Alan Kay** proposed the idea of **overlapping windows** in his 1969 University of Utah PhD. They first appeared in 1974 in his Smalltalk system at Xerox PARC, and soon after in the InterLisp system.

The main commercial systems popularizing windows were the Xerox Star (1981), the Apple Lisa (1982), and most importantly the **Apple Macintosh** (1984), the first totally graphic user-interface (**GUI**).

http://ie.youtube.com/watch?v=G0FtgZNOD44&feature=related
http://www.youtube.com/watch?v=TZGGUrom1Mg&feature=related

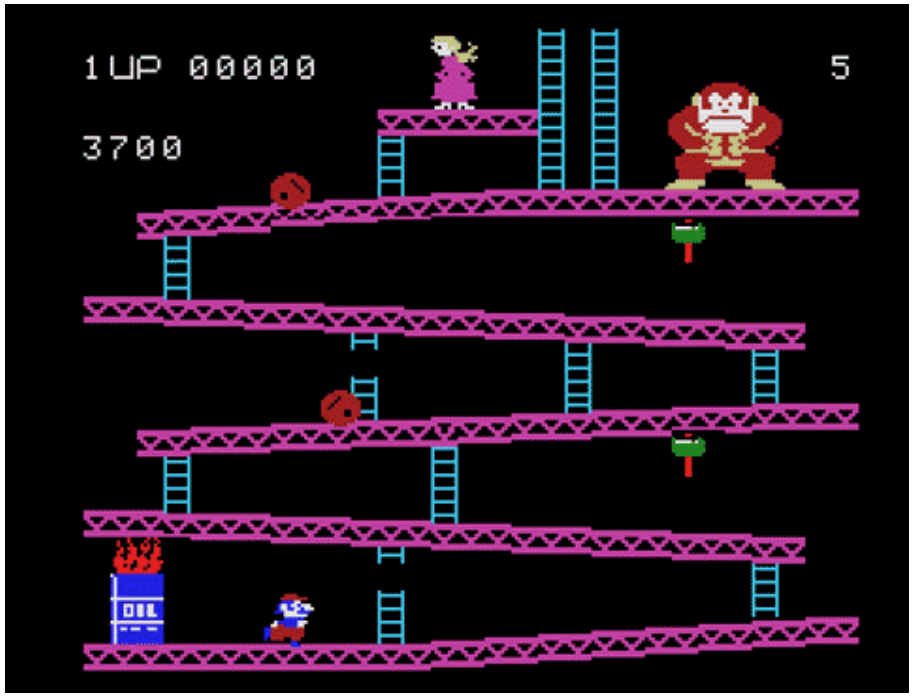
Software developments:

Drawing programs

Text editing

Spreadsheets

Video Games



Information Organisation

Vannevar Bush, 1945, “As we may think”, the **Memex**),

Ted Nelson, 1981, “**Hypertext**”, the Xanadu project

Tim Berners Lee, CERN 1989, the **World Wide Web**

Recent Developments:
Virtual Reality/Augmented Reality

Haptics and gesture recognition

Sensing devices

….and more!