

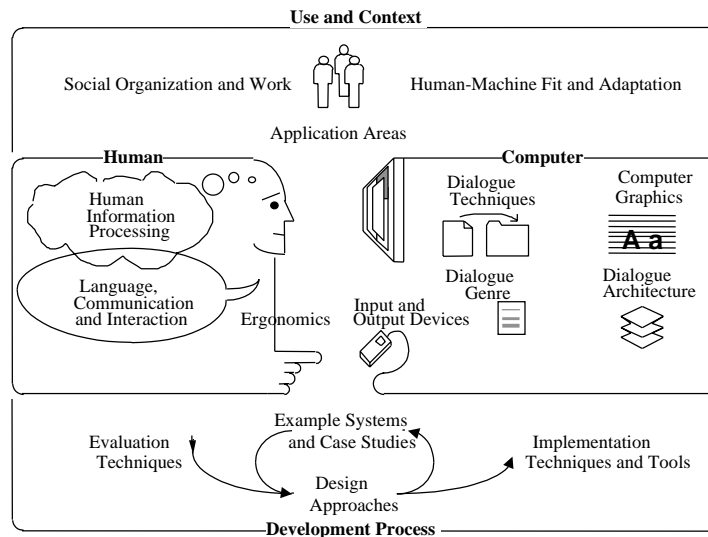
Map of Human Computer Interaction

What does the discipline of HCI cover?

Why study HCI?

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Overview: Map of Human Computer Interaction



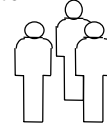
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Use and context of computers

Problems of fitting computers, their uses, and the context of use together

Social organization and work

- humans are interacting social beings
- considers models of human activity:
 - small groups, organizations, socio-technical systems
- quality of work life...



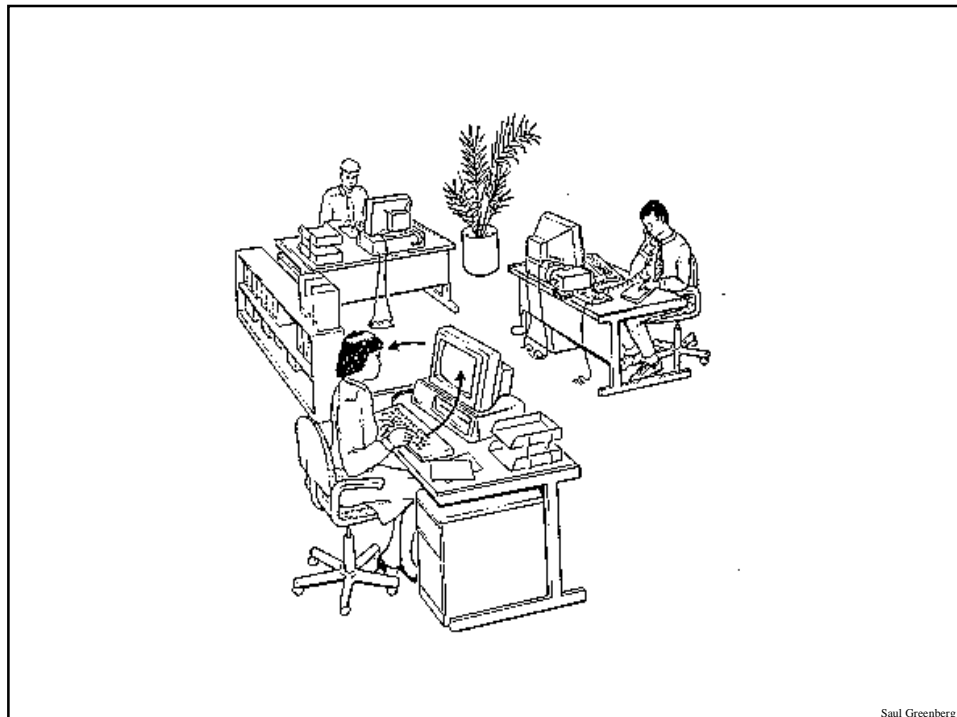
Application areas

- characteristics of application domains, e.g. individual vs group work
- popular styles
 - document production, communications, design, tutorials and help, multi-media information kiosks, continuous control (cockpits, process control), embedded systems (copiers, home appliances)

Human-machine fit and adaptation

- improve the fit between the designed object and its use
 - how systems are selected and adopted; how users improvise routine systems; how systems adapt to the user (customization); how users adapt to the system (training, ease of learning); user guidance (help, documentation, error-handling)

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Human characteristics

To understand the human as an information-processing system, how humans communicate, and people's physical and psychological requirements



Human information processing

- characteristics of the human as a processor of information
 - memory, perception, motor skills, attention, problem-solving, learning and skill acquisition, motivation, conceptual models, diversity...

Language, communication and interaction

- aspects of language
 - syntax, semantics, pragmatics; conversational interaction, specialized languages

Ergonomics

- anthropometric and physiological characteristics of people and their relationship to workspace and the environment
 - arrangement of displays and controls; cognitive and sensory limits; effects of display technology; fatigue and health; furniture and lighting; design for stressful and hazardous environments; design for the disabled...

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Computer system and interface architecture

The specialized components computers have for interacting with people



Input and output devices

- mechanics and characteristics of particular hardware devices, performance characteristics (human and system), esoteric devices, virtual devices

Dialogue techniques

- the basic software architecture and techniques for interacting with humans
 - e.g. dialog inputs and outputs; interaction styles; issues

Dialog genre

- The conceptual uses to which the technical means are put
 - e.g. interaction and content metaphors, transition management, style and aesthetics

Computer graphics

- basic concepts from computer graphics that are especially useful to HCI

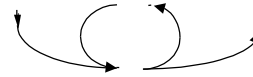
Dialogue architecture

- software architecture and standards for interfaces
 - e.g., screen imaging; window managers; interface toolkits; multi-user architectures, look and feel, standardization and interoperability

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The Development Process

The construction and evaluation of human interfaces



Design approaches

- the process of design
 - e.g. graphical design basics (typography, color, etc); software engineering; task analysis; industrial design...

Implementation techniques and tools

- tactics and tools for implementation, and the relationship between design, evaluation and implementation
 - e.g. prototyping techniques, dialog toolkits, object-oriented methods, data representation and algorithms

Evaluation techniques

- philosophy and specific methods for evaluation
 - e.g. productivity, usability testing, formative and summative evaluation

Example systems and case studies

- classic designs to serve as example of interface design genres

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Why study human use of computer systems?

Business view:

- to use humans more productively/effectively
- the human costs now far outweigh hardware and software costs



Personal view:

- people view computers as appliances, and want it to perform as one



Marketplace view:

- everyday people using computers
 - now expect "easy to use system"
 - not tolerant of poorly designed systems
 - little vendor control of training
 - heterogeneous group
- if product is hard to use, people will seek other products
 - eg Mac vs IBM (Microsoft Windows)

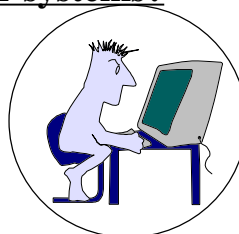


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Why study human use of computer systems?

The *system* view:

- complex human
- complex computer
- complex interface between the two



The *human factors* view:

- humans have necessary limitations
- errors are costly in terms of
 - loss of time
 - loss of money
 - loss of lives in critical systems
 - loss of morale
- design can cope with such limitations!



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Why study human use of computer systems?

The *social* view:

Computers contribute to critical parts of our society, and cannot be ignored

- educate our children
- take medical histories and provide expert advice
- keep track of our credit worthiness
- play(?) war games (and help form policies)
- control air and ground traffic flow
- book travel
- control chemical/oil/nuclear plants
- control space missions
- assist humans with their everyday tasks (office automation)
- control complex machines (aircraft, space shuttles, super tankers)
- help control consumer equipment (cars, washing machines)
- entertainment (games, intellectual stimulation)....

In all these views, economics and human best interests are aligned

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You know now

The HCI discipline includes the study of:

- the use and context of computers
- human characteristics
- computer system and interface architecture
- the development process

HCI is worth studying because it aligns both human interests and economic interests

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