chapter 0
Introduction

Terminology
- Mensch-Maschine-Schnittstelle
- Human-Computer Interface
- **Human-Computer Interaction (HCI)**
- Mensch-Maschine-Interaktion
- Mensch-Maschine-Kommunikation

Timetable

<table>
<thead>
<tr>
<th>Event</th>
<th>Time</th>
<th>Place</th>
<th>Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lecture</td>
<td>Tuesday, 14-16</td>
<td>ExWi B7</td>
<td>Sept 16</td>
</tr>
<tr>
<td>Exercises</td>
<td>Tuesday, 16-17</td>
<td>ExWi B7</td>
<td>Sept 16</td>
</tr>
</tbody>
</table>

Lecture team

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Email</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thomas Strahm</td>
<td>Lecture</td>
<td>strahm@iam</td>
<td>631 49 98</td>
</tr>
<tr>
<td>Samuel Bucheli</td>
<td>Exercises</td>
<td>bucheli@iam</td>
<td>631 33 24</td>
</tr>
<tr>
<td>Sarah Gerhard</td>
<td>Exercises</td>
<td>sarahg@students</td>
<td></td>
</tr>
</tbody>
</table>

Lecture website

- We maintain a website for the lecture with
  - basic links
  - lecture slides
  - exercise sheets
  - an application form for a mailing list
- [http://www.iam.unibe.ch/~iam/mms](http://www.iam.unibe.ch/~iam/mms)

Exercises

- 6 exercise sheets
- problems mainly from the textbook
- some problems have open solutions
- you need five accepted exercise sheets in order to get the testat
- group work is encouraged
The textbook

Alan Dix, Janet Finlay, Gregory A. Abowd, Russell Beale
Human-Computer Interaction
3rd edition, Pearson, Prentice Hall, 2004
The book can be bought at the Stud. Buchgenossenschaft, Hauptgebäude Uni Bern

The book website

http://www.hcibook.com/e3/
with lots of resources and and supporting material
(see e.g. the chapter links!)

Further references

- Preece, Rogers, Sharp,
  Interaction design: beyond human-computer interaction,
  John Wiley, 2002
  http://www.id-book.com/
- Preece, Rogers, Sharp,
  Human-Computer Interaction,
  Addison Wesley, 1994
- Norman,
  The design of everyday things

Further references

- Shneiderman, Plaisant,
  Designing the user interface: strategies for effective human-computer interaction,
  4th edition, Addison Wesley, 2004
- Rosson, Carroll,
  Usability engineering: scenario-based development of human-computer interaction,
  Morgan Kaufmann, 2002

what is HCI?

- an academic discipline
  - studying people interacting with (computer) technology
- a design discipline
  - designing interventions for systems involving people & computers

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.”

Hewett, Baecker, Card, Garey, Mantei, Verman, Strong & Verplank
ACM SIGCHI Curricula for Human Computing Interaction
Map of Human Computer Interaction

What does the discipline of HCI cover? Why study HCI?

The following slides are an excerpt from Saul Greenberg’s “Overview and Taxonomy of HCI”, which in turn is adapted from Section 2 of the ACM SIGCHI Curricula for HCI, ACM Press, 1992 (see http://sigchi.org/cdg/)

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

Use and context of computers

- 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 system (training, ease of learning); user guidance (help, documentation, error-handling)
Human characteristics

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

Human characteristics

- 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...

Human characteristics

- 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

Computer system and interface architecture

The specialized components computers have for interacting with people

- Input and output devices
- Dialogue techniques
- Dialog genre
  - The conceptual uses to which the technical means are put
    - e.g. interaction and content metaphors, transition management, style and aesthetics

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

The Evaluation Process

- 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
Summarizing

- 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

HCI changes and trends

increasing multiplicity

- 1980s - personal computers
  - one man and his machine
  - and they were men!

increasing multiplicity

- 1980s - personal computers
- late 1980’s & 1990s - CSCW
  - lots of people
  - geographically remote
  - but ...
  - one person per machine
  - and ...
  - one machine per person

increasing multiplicity

- 1980s - personal computers
- late 1980’s & 1990s - CSCW
- family use, global networks, ubiquitous devices

families and friends

lots of people, together and remote
how many …

• computers in your house?
• computers in your pockets?

ubiquitous & wearable computing

• sensors and devices everywhere

from - dialogue with the computer

to - dialogue with the environment

work and fun

• traditional HCI methods
  - tasks, goals, work, work, work
• now
  - e-shopping, communities, home
  - experience and enjoyment
  - more decision points

useful, usable and used

• useful
  - functional, does things
• usable
  - easy to do things, does the right things
• used
  - attractive, available, acceptable to organisation
HCI: craft or science?

- does HCI involve
  - artistic skills and fortuitous insight or
  - reasoned methodical science?
- draw analogy with architecture
- beautiful and/or novel interfaces are artistically pleasing and capable of fulfilling the tasks required
- marriage of art and science

Course Outline

- Part I: Foundations
- Part II: Design Process
- Part III: Theories and Models

Course outline I

- the human
  - input-output channels
  - human memory
  - reasoning and problem solving
  - emotion
  - individual differences
- the computer

Course outline II

- interaction design basics
  - the process of design
  - user focus
  - navigation design
  - screen design
  - iteration and prototyping
- HCI in the software process
Course outline II

- design rules
  - principles to support usability
  - standards
  - guidelines
  - golden rules and heuristics

Course outline II

- evaluation techniques
  - goals of evaluation
  - evaluation through expert analysis
  - evaluation through user participation
  - choosing an evaluation method

- universal design
  - principles
  - multi-modal interaction
  - designing for diversity

Course outline III

- cognitive models
  - goal and task hierarchies: GOMS
  - linguistic models

- communication and collaboration models
  - face-to-face communication
  - conversation
  - text-based communication
  - group working

Course outline III

- task analysis
  - task decomposition
  - knowledge-based analysis
  - uses of task analysis

- dialog notations and design
  - different notation models
  - dialog semantics

Course outline III

- models of the system
  - standard formalisms
  - interaction models

- modelling rich interaction
  - status event analysis
  - rich contexts
  - low intention interaction

Course outline

- groupware
  - groupware systems
  - computer-mediated communication
  - shared applications and artifacts
  - etc.
The design of everyday things

Emotional design

Good designs

Here are some examples from Don Norman's website:

http://www.jnd.org/GoodDesign.html

WMF Whisk -- with wire

LeapFrog's "Twist and shout multiplication"

The Tyg
Bad doors do good (?)

- "I know, this is supposed to be about good design, but I couldn't resist adding this wonderful story: Robbers foiled because they couldn't open the doors into the restaurant they planned to rob. They pushed, pulled, and kicked, but they were sliding doors. Yes, there was a sign, but as you all know, if it needs a sign, it's badly designed”
- "In this case, bad design led to a good result. Hope this doesn't entice others to do badly in hopes of similar good results”
- from [http://www.jnd.org/GoodDesign.html](http://www.jnd.org/GoodDesign.html)