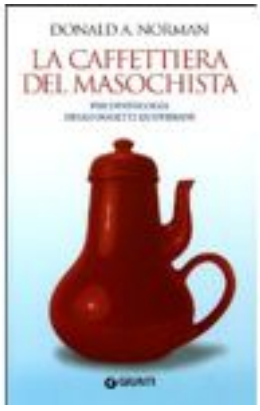
DH2620, 6hp, course responsible Cristian Bogdan
DA7041, 7,5 hp, course responsible Cristian Bogdan
DH2624 (mdi-cl), 1,5 hp, course responsible Elina Eriksson

In this course you will learn to approach **realistic** and therefore **not completely formulated** design problems that involve **both humans and technology.**



Cover of Italian version for Donald Norman's *Design of Everyday Things*

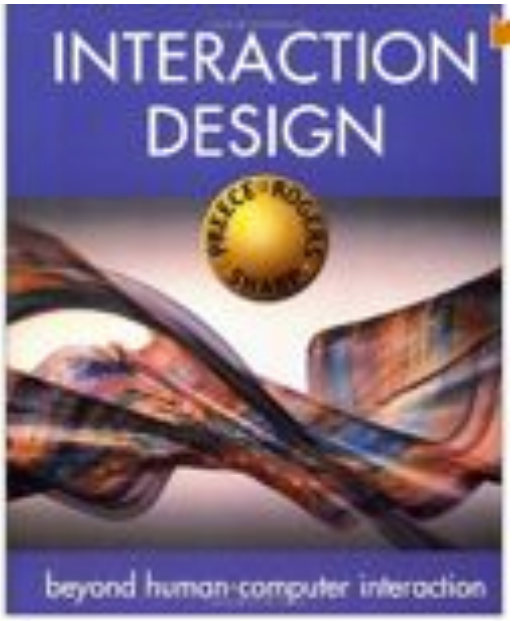
Course goals

After this course you will be able to practically:

- apply established methods for
  - identifying what characterizes an interactive products' **target group and use situation** from a given design task
  - formulate realistic requirements for a given design task, **through the analysis of the present situation** (user studies, studies of existing technology, HCI theories)
  - design and judge **alternative solutions**, as well as reason about their **qualities and limitations** in a group, based on literature, user studies and experience of other existing technologies
  - gestalt **design** with the help of different tools and materials, from paper sketches to digital interactive prototypes
  - **evaluate** your and others' design with and without users, to support **well grounded design decisions** in HCI

Course objectives (cont'd)

- make design **reflections** as part of an iterative design process, and ground them in relevant HCI theories and methods
- communicate and **present** design properties of interactive artifacts for different stakeholders
- relate HCI theories and methods to other system development principles
- relate HCI theories and methods to economical factors.



Examination

- Project, 3hp
  - Groups of 6-7, formed in Bilda.
  - Five project groups form an övningsgrupp, and sit in class together at supervision meetings
  - 6 supervision meetings, you can miss one
  - Each supervision meeting assigns project work
    - Presented at next meeting
  - 1 literature seminar, if you are absent you must send a written abstract
  - We are setting up a project *competition* and *prizes*
- Self-reflection on group work in relation to course goals, and contribution assessment from group peers 3 hp, grade A-Fx
  - Submitted individually in our own teaching support system
  - Mid-term submission and peer assessment for you and us to check how far you got and what needs to be improved
  - Final submission for the course grade
  - Deadlines TBA

Cristian Bogdan
Kursansvarig, examinator

Jan Gulliksen
Föreläsare

Kia Höök
Föreläsare

Filip Kis
Kurs administrator

Övningsledare:

- Anders Lundström
- Helena Tobiasson
- Vygandas Simbelis
- Mattias Jacobsson
- Rósa Gudjonsdottir

Course changes

- The course has the similar design as DH1620 (for Datalogi)
  - So we learn from autumn to spring
- DH1620 introduced grading based on the project work with peer assessment
  - It worked well, so we keep that
- Examination will be project-based, no more home exam
  - Still peer grading from project colleagues
- Literature seminars instead of group assignments
  - Also introduced in DH1620 and well appreciated

Administration

- Are you a member of the Bilda group DH2620 HT2013?
  - If not, write to Filip Kis fkis@csc.kth.se
- Join a project group, via Project Groups in Bilda, by the end of the 2nd course week!
  - Groups are limited to 6 members, only a few will be of 7
- Register to the course by KTH "Personal Menu" (mina sidor)

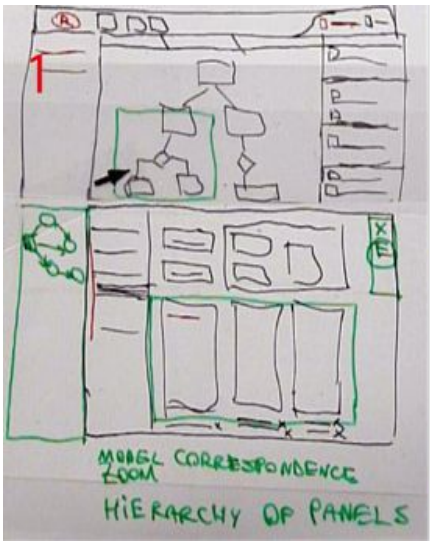
From my portfolio

- Human Robot Interaction
- Interaction Prototyping through Video
- User Interface Modeling
- Electric Vehicle user interfaces

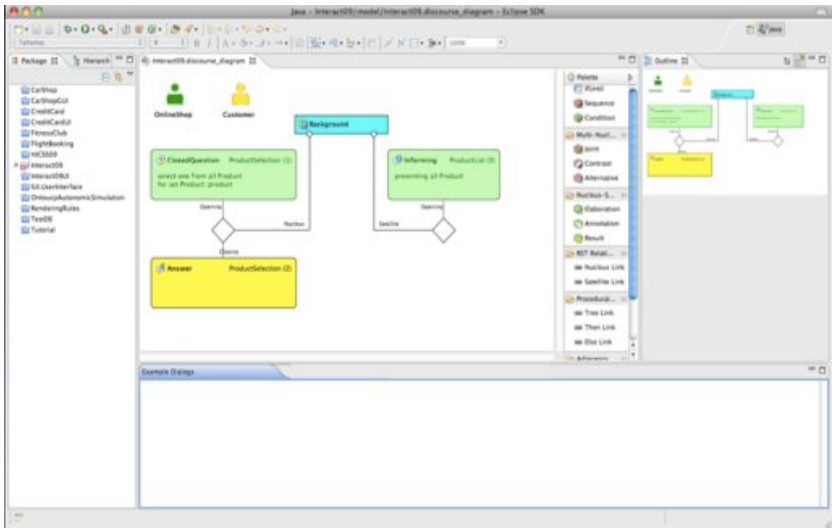
Human-Robot Interaction

The **CommRob** project
http://www.commrob.eu

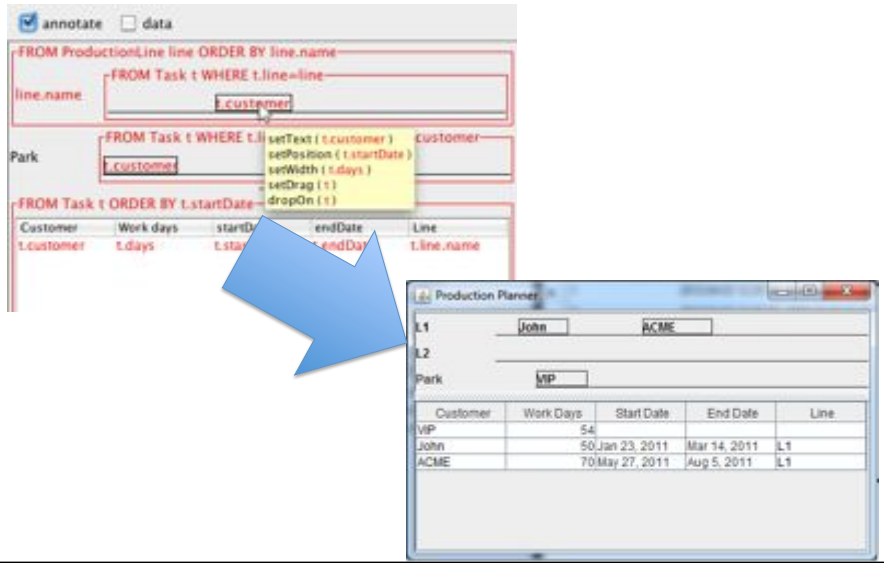
Interaction Prototyping through Video.



User Interface Modeling

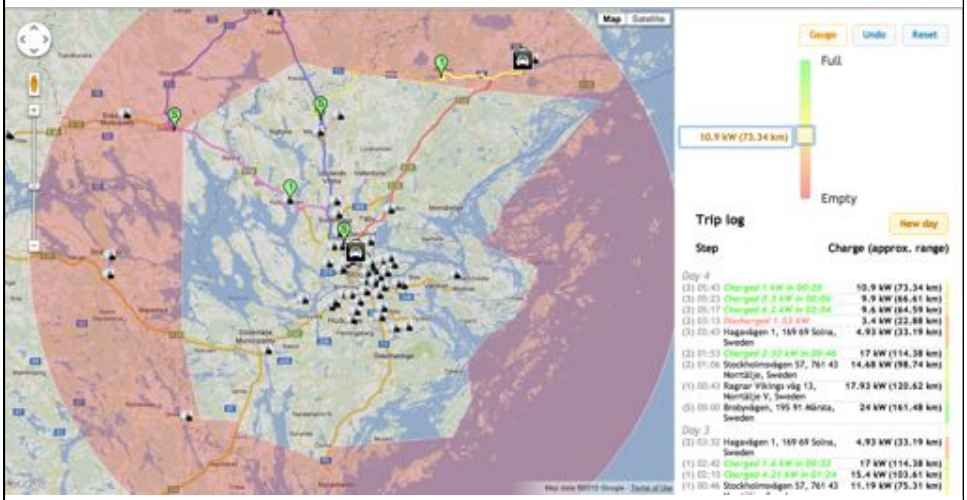


User Interface Modeling



Electric Vehicle User Interfaces

EVERT



Tales of Interaction

Stories on interactive system usage and some of the theoretical concepts involved

Goals

- To motivate HCI for an engineering audience
  - Not so hard today, how many MP3 players existed before the iPod?
- To illustrate some of the concepts that HCI works with
- To put HCI in historical perspective
- HCI place among other disciplines

Two dishwasher interface designs

Lessons

- Even a small set of functionalities can be presented to users in a multitude of ways
- *Familiarity* (part of *Learnability*)
  - Left to right, "Engage" button
- Usability: *effectiveness, efficiency, satisfaction* (introduced later)
  - Why do I like pressing that On-Off button placed at the top? *Affordance?*
- Many technologists will *optimize*
  - the number of buttons?
  - the number of button presses? First time of use? Following times?
- Video as a suitable medium to present interaction, reflect upon it, design it
- *Interaction analysis* as a technique to understand people and technologies

User models of an elevator

Elevator "forgets" its destination *sometimes* when e.g.:

- pressing the button while coming in hastily
- pressing the button while another person just comes in
- trying to send the elevator un-manned to another floor

T (80+, lived in the house even before the elevator was built): *glitch in the buttons*

K (35, software engineer): *(for unmanned trip) When this happens, open the door, press button, and close it again*

C (40, software engineer, HCI):

1. *it may have to do with the door angle at the time the button is pressed*

My most recent elevator model

2. The motion sensor near the door always cancels the destination when triggered. You can happen to evade the sensor and then the elevator will work as expected.

Lessons

- People can live with wrong mental models of the technology for years
- Different people perceive the same technology differently, though they use it together
- User models change as they get new experiences with the technology
- Safety and security constraints are often in conflict with usability
- If all this happens with 4-button elevators, consider hundred-features interactive products
- Interface is not just buttons. What else is the interface of an elevator? Embodied interaction.
- We usually notice technology only when it stops working
  - The well-designed features are seldom noticed

Human Error

Montparnasse derailment, 1895

Wrong mental model: Flight KAL 007

Figure source: photobucket.com

Condition	Meaning	Autopilot Display
HEADING chosen	Fly in a fixed direction	HEADING
INS chosen	Follow a set of waypoints	INERTIAL NAVIGATION
INS chosen but aircraft further than 7,5 nm away from first waypoint	Keep the Heading state => fly in the fixed direction selected earlier	INERTIAL NAVIGATION ARMED

…. there was no indication that HEADING mode was still active. This ambiguous design lead the pilots to believe that the INS mode was taking them to Seoul, when in fact the HEADING mode was taking them towards Soviet airspace. After this accident, the 747's autopilot display was redesigned to prevent such accidents occurring again. [aviationknowledge.wikidot.com]

Lessons

- The context of interaction
  - The micro-social context of an aircraft cockpit
- People sitting, at work, for a long time
  - Compare with using a smart phone
- HCI comes from the Human Factors tradition
- Human Factors, work centered, evaluative,
- HCI, Usability, evaluative
- Interaction Design, generative

Smartphone: entering a password

Source: unity3d.com

- A password with lots of Ls or Ms has issues
- Difficult to figure out for the user
- Correct mental model, wrong action => Slip

User errors

- Mistakes: wrong mental model, wrong understanding of the technology or its state
- Slips: correct mental model but wrong action
  - Physically slipping to another key
  - Reversing things
- Norman, *Design of everyday things*, 1988
- Was the KAL 007 error a mistake or a slip?
- http://www.interaction-design.org/encyclopedia/human_error_slips_and_mistakes.html

What can go wrong?

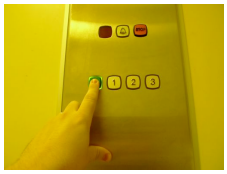
A user enters the elevator at the ground floor (B), with the goal of getting to floor 2

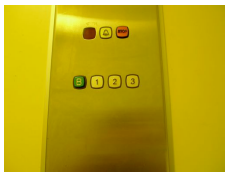
. The user presses B.

The elevator confirms the destination "B" briefly by highlighting the B button, and when the button is not pressed any more, it goes back in "idle" state.

The user remembers that this brief confirmation happens when the elevator is out of order. The user takes the stairs

up to the second floor, planning to call elevator repair later





A user enters the elevator at the ground floor (B), with the goal of getting to floor 2 where they have lived for some years. The user thinks about an upcoming home exam. The user presses B.

The elevator confirms the destination "B" briefly by highlighting the B button, and when the button is not pressed any more, it goes back in "idle" state.

The user remembers that this brief confirmation happens when the elevator is out of order. The user takes the stairs (which they rarely do, either upwards or downwards) up to the second floor, planning to call elevator repair later. The user continues to think about the home exam.

Is this a user error? What kind?

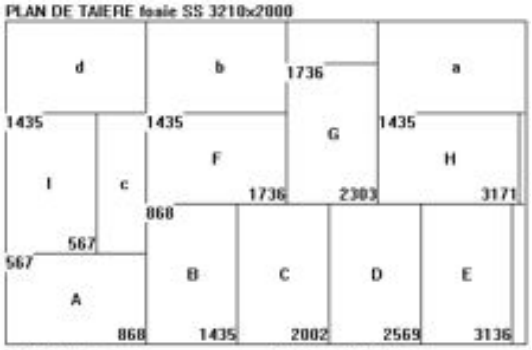
Lessons

- Humans are not machines!
- Humans are not perfect!
- They can go wrong in many ways
- We need to anticipate that and try to support them
  - How would a better smartphone/touchscreen password entering interface look like?

And

- Text as “user interface”
- Importance of contextual information

Surface optimization: from algorithm to interface



REPERE: 68.99%
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RESTURI: 27.33%
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b: SS-4.1-AA2971 868x 565
c: SS-2.2-AA2972 301x 868
d: SS-4.1-AA2973 868x 565

PIERDERI: 3.68%

Lessons

- What glass cutters need is different from what an engineer needs (and thus think glass cutters would need)
  - The printout as interface
- Engineer and interaction designer priorities may be very different
  - HCI as *inter-disciplinary*
  - Graphic design, industrial design, sociology, psychology, anthropology, architecture
- Technical artifacts such as algorithms might make little sense in practice (with *users*, in *context*) and may need adaptation

You do good HCI/IxD when…

- Look at interaction in terms of HCI concepts and theories, not just common sense
- Start from people's perspectives, not yours
- Start from the user needs, rather than from technology
- Notice good interaction design (not only failing design) and reflect upon it
- Think of interaction as central, not as a "last thing" to be added to a system
- Consider several designs, not just one