Interaction Design

Chapter 1 (April 14, 2016, 9am-12pm):
History
Tutorials & Exam

• **Interaction Design** required for Concept Development
• no Podcast, so be here every week :) 
• register via UniWorX!

• **tutorials** close to the lecture 
• practical exercises to apply theoretical knowledge 
• important preparation for the exam 
• will be held in breakout sessions during the lecture 
• sometimes a bit homework possible 

• **Bonus** of 5% in exam possible if you hand in deliverable at the end 
• deliverable: sketchbook with works during and inspired by the course / documentation of the course to be delivered at the end of the semester (at the last lecture) 
• **Written Exam** will be announced on the website shortly 
• exact time and location will be announced soon
Course Overview:

I History & Fundamentals

April / May       June       July
Course Overview:

April / May

June

II Applying Interaction Design

July
Course Overview:

III Beyond the Desktop

April / May  |  June  |  July
History

- Course Overview (Timetable) + Organizational Stuff
- What is Interaction Design?
  - The Story of the Mouse
  - PARC
  - The Desktop Metaphor
  - The GUI
Gillian Crampton Smith

-established the first Interaction Design MA program at the Royal College of Art (RCA)
-was the founder and academic director of the Interaction Design Institute Ivrea (IDII)

http://www.designinginteractions.com/img/interviews/GillianCramptonSmith.jpg

source: [2]
705 ALMA ST.

ALL SYSTEMS NORMAL
01:53P Wed 09/04/02
Looking back... (Discussion Part)
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-shaping our lives through digital artefacts...
Looking back...

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-good IxD refers to a “mental model”
Looking back...

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-good IxD provides a “map” of where you are in a system, how you can move around and how you get back to the point where you started
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-languages of interaction design
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-languages of interaction design
-elements of interaction design
Looking back...

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-good IxD refers to a “mental model”
-good IxD provides a “map” of where you are in a system, how you can move around and how you get back to the point where you started
-languages of interaction design
-elements of interaction design
-the part of the interaction designer is to design the quality on how the interaction is performed, how the system behaves
Designing for Everyday Life

25 years ago  today
Designing for Everyday Life

(1) Professional Tools

(2) Game Machines for Teenagers

25 years ago to today
New Challenges

(1) Professional Tools

(2) Game Machines for Teenagers

(1) Larger user groups (e.g. Kids/Parents/Grandparents)

(2) Various Contexts of use (e.g. Work/School/Home/Leisure)

25 years ago today
"Great design is as much about prospecting in the past as it is about inventing the future."

Bill Buxton
History

• Course Overview (Timetable) + Organisational Stuff
• What is Interaction Design?

• The Story of the Mouse

• PARC
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The 

Beginnings...

(let’s jump back to 1943)
P 38 Lightning Cockpit (1943)

http://www.world-war-2-planes.com/lockheed-p-38.html
EDSAC computer (1949)

http://www.xgn.nl/images/upload/20080908172430.jpg
"I think there is a world market for maybe five computers."

Thomas Watson, chairman of IBM, 1943
Mid sized ICs

http://upload.wikimedia.org/wikipedia/commons/8/80/Three_IC_circuit_chips.JPG
Punch Card

http://datentraeger-museum.de/Media/Shop/lochkarte_01.jpg
“When you were interacting considerably with the screen, you needed some sort of device to select objects on the screen, to tell the computer that you wanted to do something with them.”

Douglas C. Engelbart, 2003, referring to 1964
Looking back... (Discussion)

[Image of early computer mouse]

http://1.bp.blogspot.com/_jhhJghwNlgo/ST01UsQ74oI/AAAAAAAAA7k/5xDWdR-4ODY/s400/worlds+first+mouse.jpg
Looking back... (Discussion)

-reflection of the process (concept generation)
Looking back... (Discussion)

- reflection of the process (concept generation)
- construction of different prototypes (alternative design)
Looking back... (Discussion)

- reflection of the process (concept generation)
- construction of different prototypes (alternative design)
- iterative development of prototypes (prototyping and testing)
Looking back... (Discussion)

- reflection of the process (concept generation)
- construction of different prototypes (alternative design)
- iterative development of prototypes (prototyping and testing)
- tests with users to validate the approach and make decisions (usability testing)
Interaction design

User-experience design

Information architecture

Communication design

User Interface engineering

Human factors

Usability engineering

Human-computer interaction

source: [3]
Stanford Research Institute (SRI), 1962.
1. **Artefacts**—physical objects designed to provide for human comfort, the manipulation of things or materials, and the manipulation of symbols.
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2. **Language**—the way in which the individual classifies the picture of his world into the concepts that his mind uses to model that world, and the symbols that he attaches to those concepts and uses in consciously manipulating the concepts (“thinking”).
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3. **Methodology**—the methods, procedures, and strategies with which an individual organises his goal-centered (problem-solving) activity.
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3. Methodology—the methods, procedures, and strategies with which an individual organises his goal-centred (problem-solving) activity.

4. Training—the conditioning needed by the individual to bring his skills in using augmentation means 1, 2, and 3 to the point where they are operationally effective.
The system we wish to improve can thus be visualised as comprising a trained human being, together with his artefacts, language, and methodology.
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History

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- The GUI
founded 1970 by Xerox
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Marc Weiser

The Computer for the 21st Century

Specialized elements of hardware and software, connected by wires, radio waves and infrared, will be so ubiquitous that no one will notice their presence.

by Mark Weiser

The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.

Consider writing, perhaps the first information technology. The ability to represent spoken language symbolically for long-term storage freed information from the limits of individual memory. Today this technology is ubiquitous in industrialized countries. Not only do books, magazines and newspapers convey written information, but so do street signs, billboards, signs and even graffiti. Currency denominators are covered in writing. The constant background presence of these products of "mechanized" technology does not require active attention, but the information to be transmitted is ready for use at a glance. It is difficult to imagine life otherwise.

Silicon-based information technology, in contrast, is far from having become part of the environment. More than 50 billion personal computers have been sold, and the computer nonetheless remains largely in a world of its own. It is approachable only through complex jargon that has nothing to do with the tasks for which people use computers. The state of the art is perhaps analogous to the period when scribal had to know much about making ink or baking clay as they did about writing.

The scenario that surrounds personal computers is not just a "user interface" problem. My colleagues and I at the Xerox Palo Alto Research Center think that the idea of a "personal" computer itself is misplaced and that the vanes of laptop machines, dials, knobs and "knowledge navigators" is only a transitional step toward achieving the real potential of information technology. Such machines cannot truly make computing an integral, invisible part of people's lives. We are therefore trying to conceive a new way of thinking about computers, one that takes into account the human world and allows the computing devices to vanish into the background.

Such a reappraisal is a fundamental consequence not of technology but of human psychology. Whenever people learn something sufficiently well, they cease to be aware of it. When you look at a street sign, for example, you absorb its information without consciously performing the act of reading. Computer scientists, economists and sociologists Herbert A. Simon calls this phenomenon "computing," philosopher Michael Polanyi calls it "the tacit dimension," sociologist J. J. Gibson calls it "visual unison"; psychologists Hans Eysenck calls it "the 'fast' channel" and Martin Bodleman calls it the " Hododynamo" and the "visual-to-hand." John Selye Brown of P.A.C.S. calls it the "periphery." All say in essence that only when things disappear in this way are we freed to use them without thinking and so to focus beyond them on new goals.

The idea of integrating computers seamlessly into the world at large runs counter to a number of present-day taboos. "Ubiquitous computing" as this concept does not mean just computers that can be carried in the pocket, handbag or briefcase; even the most powerful notebook computer, with access to a worldwide information network, still requires attention on a single box. By analogy with writing, carrying a super-laptop is like owning but one very important book. Customizing this book, even writing millions of other books, does not begin to capture the real power of literacy.

Furthermore, although ubiquitous computers may use sound and video in addition to text and graphics, that does not make them "multimedia computers." Today's multimedia machine makes the computer screen into a demanding focus of attention rather than allowing it to fade into the background. Perhaps more frighteningly, to our vision is the notion of virtual reality, which attempts to make a world inside the computer. There are special goggles that project an artificial scene onto your eyes, but they are not seamless or even body suits that sense your motions and gestures so that they can move about and manipulate virtual objects. Although it may have its purpose in allowing people to explore realms otherwise inaccessible—the inside of cells, the surfaces of distant planets, the information world of data bases—virtual reality is only a map, not a territory. It excludes desks, offices, other people not wearing goggles and body suits, weather, trees, rocks, coins, mirrors and, in general, the infinite richness of the universe. Virtual reality foists an enormous apparition onto stimulating the world rather than on innocently enhancing the world that already exists.

Indeed, the opposition between the
Stu Card

- joined Xerox Palo Alto Research Center (PARC) in 1974
- aimed at perfecting scientific methods to integrate with creative design
- developed a process to predict the behavior of a proposed design, using task analysis, approximation, and calculation
- proposed a partnership between designers and scientists, by providing a science that supports design.

http://www.designinginteractions.com/interviews/StuCard
Looking back...

-exploration of the design space through the integration of industrial design
Looking back...

-exploration of the design space through the integration of industrial design
-designers and engineers had to work together (interdisciplinary approach)
Looking back...

-exploration of the design space through the integration of industrial design
-designers and engineers had to work together (interdisciplinary approach)
-science served to constrain the design space
History

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Microprocessor early 1970s
Tim Mott

-collaborated remotely with Xerox Palo Alto Research Center (PARC) and Larry Tesler
-worked on a new publishing system that included a “desktop metaphor”
-invented a “user centred design process” with Larry Tesler
-later co founded Electronic Arts (EA)

http://www.designinginteractions.com/interviews/TimMott
The injured were taken to MeritCare Hospital, where they were treated. According to Sheriff Larry Costello, none were seriously hurt. The driver of the southbound vehicle, the spokesperson MeritCare said, about seventeen workers attended seven sessions. The delegate from N.D. came to Moorhead, Minn.

Upper case majored in English literature at Msum.

Lower case Bachelor's Degree in Mass Communications.

Remove space extra effort will be required.

Insert space according to sources close to the president will be completed in early January.

Delete the very exciting climax of the film.

Insert word the exciting climax of the film.
Looking back...

-spending time to understand users (design research)
Looking back...

- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
Looking back...

- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)
Looking back...

- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)
- asking users to “walk” them through the system (think aloud method)
Looking back...

- spending time to understand users (design research)
- designing by involving the users of the system (participatory design techniques)
- prototyping parts of the system with non functional elements (wizard-of-oz prototyping)
- asking users to “walk” them through the system (think aloud method)
- designing the system using mental models user could refer to (metaphors+scenarios)
Office Schematic / Desktop Metaphor
Xerox Alto 1973

http://dl.maxumpc.com/galleries/oldpcs/xerox_alto_front_full.jpg

The Xerox Alto boasted the world’s first “what you get” (WYSIWYG) editor, mouse, graphical user interface (GUI) and bit-mapped display. Its pop-up menu became the model for the Microsoft “Window” Macintosh interfaces of today.
"There is no reason anyone would want a computer in their home."

Ken Olson, president, chairman and founder of DEC, 1977
Now you can create documents with words and pictures

1981 Xerox Star Workstation
XEROX 6085 Workstation

User-Interface Design

To make it easy to compose text and graphics, to do electronic filing, printing, and mailing all at the same workstation, requires a revolutionary new interface design.

Bit-map display - Each of the pixels on the 19" screen is mapped to a bit in memory, thus, arbitrarily complex images can be displayed.

The 6085 displays all fonts and graphics as they will be printed. In addition, familiar office objects such as documents, folders, file drawers and in-boxes are portrayed as recognizable images.

The mouse - A unique pointing device that allows the user to quickly select any text, graphic or office object on the display.

See and Point

All functions are visible to the user on the keyboard or on the screen. The user data filing and retrieval by selecting them with the mouse and invoking the FBO, COPY, DELETE or PROPERTIES command keys. Text and graphics are edited with the same keys.

Figure 7: Data from Table 1 drives

Table 1: Percentages of use of methods

Activity under the old and the new.

<table>
<thead>
<tr>
<th>Method</th>
<th>Old (%)</th>
<th>New (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1973</td>
<td>15.2</td>
<td>19.4</td>
</tr>
<tr>
<td>1976</td>
<td>41.1</td>
<td>58.9</td>
</tr>
<tr>
<td>1985</td>
<td>45</td>
<td>55</td>
</tr>
<tr>
<td>1988</td>
<td>70</td>
<td>70</td>
</tr>
<tr>
<td>1990</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

Figure 6: Data from Table 1 drives

Table 2: COS & Lotus data

<table>
<thead>
<tr>
<th>NAME</th>
<th>EXTENSION</th>
<th>SIZE</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME</td>
<td>COMMAND</td>
<td>22637</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>SYS</td>
<td>2856</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>ASSIGN</td>
<td>584</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>ATTRID</td>
<td>15091</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>BACKUP</td>
<td>17024</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>CHKDISK</td>
<td>9435</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>CHMOD</td>
<td>6928</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>COMP</td>
<td>5018</td>
<td>15-15</td>
</tr>
<tr>
<td>NAME</td>
<td>DEBUG</td>
<td>15364</td>
<td>15-15</td>
</tr>
</tbody>
</table>

Workstation usage percentages

Table 1 and illustrated in Figure 6085 users are likely to do more composition and layout. Most of the process includes printing and layout.
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Larry Tesler

-involved users also in the software design process
-joined PARC in 1973
-moved to Apple in 1980
-was the core designer of Apples “Lisa” computer
-invented the “copy and paste” function

http://www.designinginteractions.com/interviews/LarryTesler
So it became a kind of contest. An unofficial and completely unacknowledged competition to see which of us was the toughest, the coolest, the hardest to get. (He was, but there were times when he didn’t know that.) "Who is smarter, you or me?" he asked me again and again: once as he left the apartment in the morning, me wrapped in a towel; once over our whiskies at the King Cole Bar in the St. Regis. And that became the most important question.
Looking back...

- brainstorming and iterative trying and testing (iterative design process)

Research → Analysis → Concepts → Prototypes

Validate Concepts
Looking back...

- brainstorming and iterative trying and testing (iterative design process)
- constant, quick and efficient tests with users to improve the system (experience prototyping)
Looking back...

- brainstorming and iterative trying and testing (iterative design process)
- constant, quick and efficient tests with users to improve the system (experience prototyping)
- developing products for the users’ core needs (user centred design process)
Bill Atkinson

-was hired by Apple as the “Application Software Department”
-invented the “pull down” menu structure
-was the lead designer of the “Lisa” and the initial “Mac”

http://www.designinginteractions.com/interviews/BillAtkinson
Looking back...

-alternative designs in a variety (sketches & prototypes)
Looking back...

-alternative designs in a variety (sketches & prototypes)
-proposal of a participatory design approach, creating better UIs
Apple Lisa 1983

http://media.arstechnica.com/images/gui/11-Mac1.gif
Macintosh System 1.0. January 1984

http://media.technica.com/images/gui/1-Mac1.gif
WIMP
-stands for "window, icon, menu, pointing device"
-coined by Merzouga Wilberts in 1980
-is often incorrectly used as an approximate synonym of "GUI".

http://media.arstechnica.com/images/gui/11-Mac1.gif
WYSIWYG
-user interface that allows the user to view something very similar to the end result
-implies the ability to directly manipulate the layout of a document/presentation/3D model without having to type or remember names of layout commands.

October 2007: Mac OS X 10.5
over 25 years in between....
INTERACTION DESIGN

KNOW?

FEEL?

...DO?
“There is an objectivity in the process of letting the user decide, the value of which is a recurring theme in this story of designing the desktop and the mouse. **Come up with an idea, build a prototype, and try it on the intended users.** That has proved, time and time again, to be the best way to create innovative solutions.”

Bill Moggridge - Designing Interactions
References (Books):


References (Papers):


Articles: