Interaktionsdesign
E2008

Lektion 5

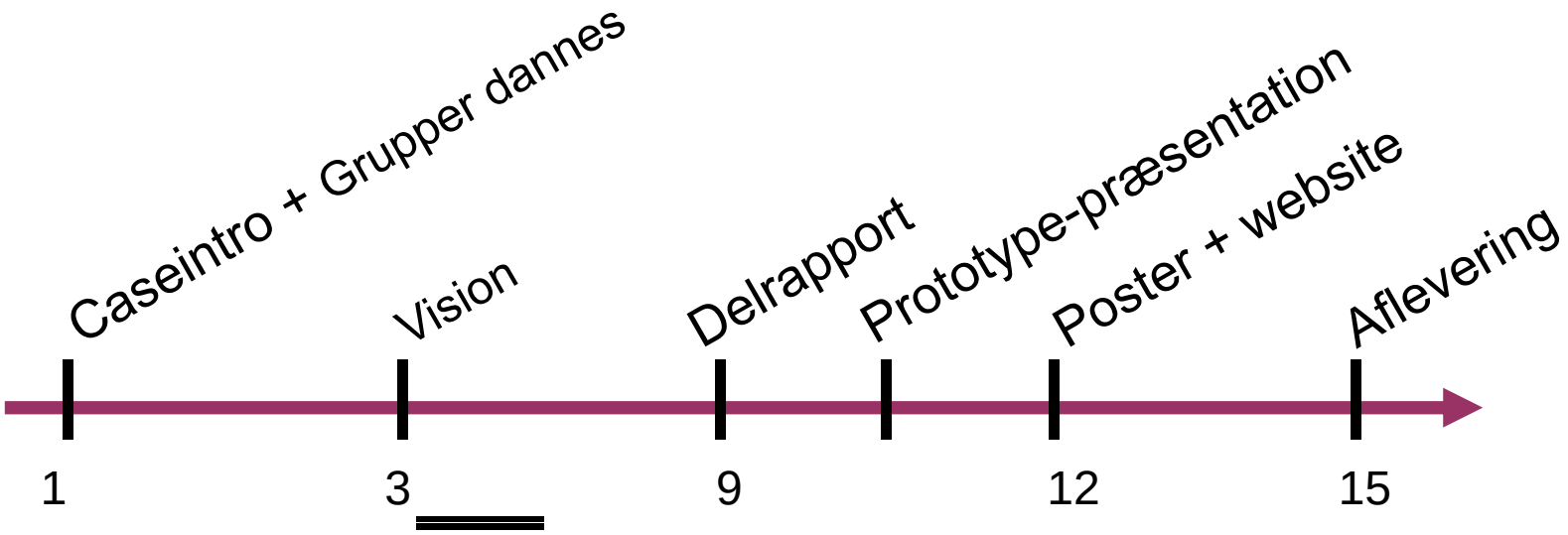
Læringsmål

- At forstå den historiske baggrund for aktuelle digitale interaktionsparadigmer
  - Dourish (kap 1)
  - Weiser
- At kende til de væsentligste interfacetyper og deres historiske fremtræden
  - Sharp
- At kunne begrunde hvordan vi kontekstualiserer teknologi i et interaktionsdesignparadigme
  - Dourish (forord)

Indhold

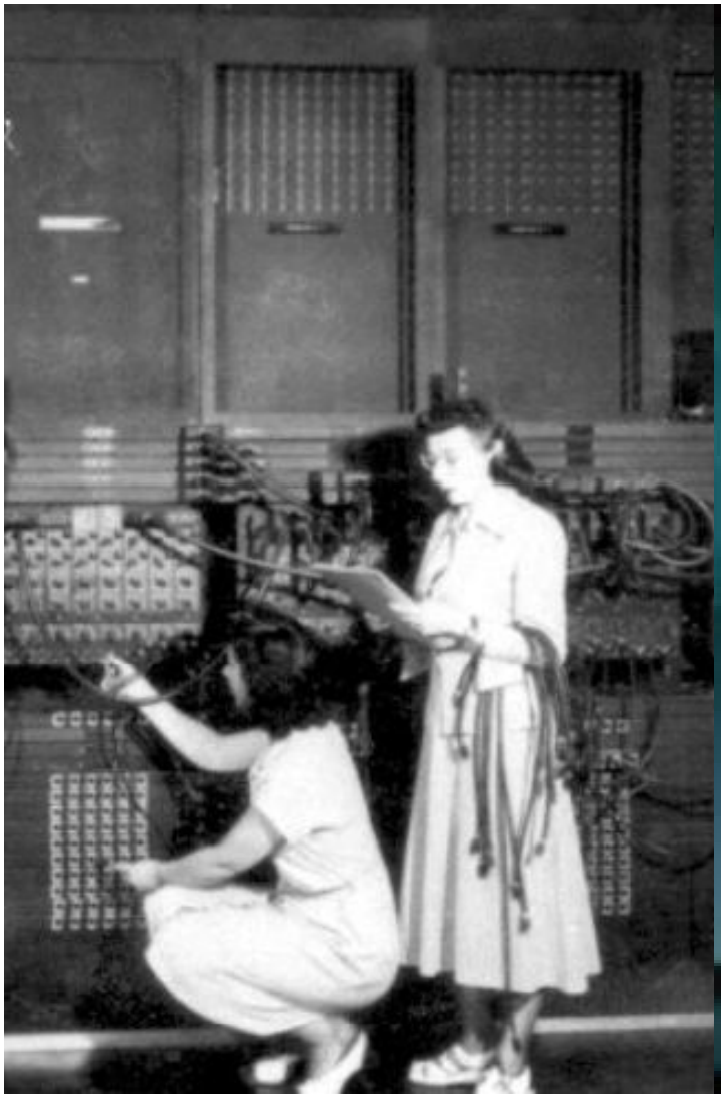
- Indtryk fra første besøg hos ældre
- Kort om workshops i næste uge
- Introduktion til Dourish
- Interaktion i en historisk kontekst
- En næsten 20 år gammel vision: ubiquitous computing
- Interface-typer og interaktionsparadigmer

Plan for kurset



Workshop
- Sketching in hardware/ Arduino
- Etnografiske metoder

Hvad handler denne forelæsning om ?



Titlen: Where the action is ??

Hvordan skal den forstås?

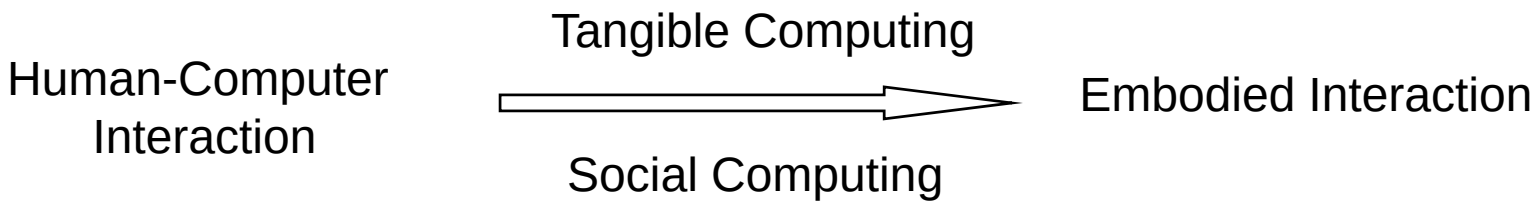
Where the action is

- First, it is about a perspective that places the action of embodied agents center stage (ix)
- Rather than take action to be generated from or subservient to abstract reasoning, the perspective I will explore here sees embodied practical action in the world as the foundation for our conscious experience (ix)
- Second, this approach is "where the action is" in the sense that it provides a way to understand the contributions and opportunities emerging from dynamic new forms of technological practice (ix)

Hvad handler Dourish's bog om?

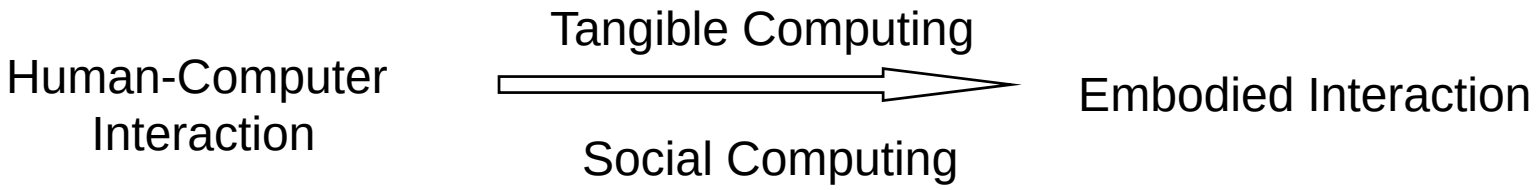
Hvad handler Dourish's bog om?

- Embodied Interaction
- A Theoretical Foundation for Embodied Interaction
- Going from the starting point *Beyond the desktop and HCI* to the new developments *Tangible and Social Computing* to *Embodied Interaction* in four steps
  - Tangible and social computing have a common basis
  - Embodiment is the core element
  - Embodiment is not new, can be informed by phenomenology
  - Phenomenology can help provide a foundation for embodied interaction



Hvad handler Dourish's bog om? (omslag)

- In this book Paul Dourish addresses the *philosophical bases* of human-computer interaction. He looks for what he calls "embodied interaction" - an approach to interacting with software systems that emphasizes *skilled, engaged practice rather than disembodied rationality* - reflects the phenomenological approaches of Martin Heidegger, Ludwig Wittgenstein, and other twentieth-century philosophers.
- The phenomenological tradition emphasizes the primacy of *natural practice over abstract cognition* in everyday activity.



Hvem er Paul Dourish?

- Paul Dourish is a computer scientist best known for his work at the intersection of computer science and social science
- Professor at the University of California, Irvine since 2000
- B.Sc. in Artificial Intelligence and Computer Science from the University of Edinburgh in 1989
- Ph.D. in Computer Science at University College London
- He has worked in research laboratories at Apple and at XEROX PARC & EuroPARC
- Kilde: Wikipedia

Preface

- Filosofi og computer science?
- Datalogi er baseret på før-1930-filosofi
- Datalogisk praksis reducerer høj-niveau adfærd til lav-niveau, mekaniske forklaringer, formaliserer dem gennem ren videnskabelig rationalitet
- Datalogi afslører herved sin historie som en positivistisk, reduktionistisk tradition
- Kognitionsvidenskab er baseret på en rigid Cartesiansk adskillelse mellem sind og materie, mellem tænkning og handling
- Under angreb siden 1930'erne: Heidegger og Wittgenstein
  - ny position inden for tænkning, sprog og mening
  - forkaster disembodied rationalitet
  - erstattes af en model af situerede agenter, der handler og interagerer frit i verden

Dourish kap. 1 overordnet disponering

1. A historical model of interaction
   - Electrical
   - Symbolic
   - Textual
   - Graphical
2. New models for interactive system design:
   Tangible and social approaches to computing
3. From tangible and social computing to
   embodied interaction

A History of Interaction

Hvad er hovedpointen i kapitel 1?

Baggrund

- Computeres udvikling: Moore's lov
  - antallet af transistorer pr. arealenhed fordobles hvert 2. år
  - computerens kapacitet fordobles hver 18. måned
- We talk about how fast it is changing, but we talk *less* about the ways in which it is *not*
- Many things about computers are not changing at all
  - Our basic idea about what a computer is, what it does, and how it does it, for instance, have hardly changed for decades
  - Nor have the difficulties we encounter actually using computers

Baggrund

- Computeren var en sparsom ressource: effektivitet & økonomi
  - ”Users and operators took great pride in the speed with which they could mount tapes and operate the hardware to minimize the idle time between jobs” (Auslander, 1981: 475).
- "It gave rise to a model that favors performance over convenience, and places a premium on the computer's time rather than people's time. This model is largely still with us today". (s. 2)
- På tide at genoverveje denne afvejning - to udviklingstendenser
  - informations-overload og computerne står stille i 95% af tiden
  - computeren indlejret i dagligdags brugsgenstande
- Leder til
  - nye måde at interagere med computeren
  - nye måder at begribe interaktion: "beyond HCI & desktop”

Baggrund

- "Over the last few years, research into HCI has begun to explore ways to control and interact with a new breed of computer systems" (s. 2)
- Hvilke, for eksempel?
- "This book is a contribution to the emerging literature on this new approach to interacting with computers, one I call 'Embodied Interaction' ".
- "Embodied Interaction is interaction with computer systems that occupy our world, a world of physical and social reality, and that exploit this fact in how they interact with us." (s. 3)

Hvad er embodiment?

Hvad er embodiment?

- Embodiment (Engelsk-Dansk) (ordbogen.com)
  - legemliggørelse; inkarnation
- Embodied Interaction - Interaction with computer systems
  - that occupy the world, a world of physical and social reality, and
  - that exploit this fact in how they interact with us.
- Embodiment: Not a property of systems, technologies, or artifacts, it is a property of interaction. It is rooted in the ways in which people (and technologies) participate in the world. (189)
- Wikipedia
  - In essence embodiment as an idea binds two worlds of substance and spirit, contrary to a duality (Descartes).
  - Thus body and mind are fused into a single being - the only distinction between matter and person being the way of observing the being.

Afviger fra andre HCI fremstillinger

- Mere om
  - interaktion end interfaces
  - computation end computers
  - representational power end om Gigabytes and Megahertz
  - foundational end technical
- Ikke en bog om design-løsninger eller en "how-to-do-it"
- "The goal of this foundational exploration is to provide resources to designers, by giving them tools thay can use to understand and analyze their designs."
- Interaktion i centrum: ikke *hvad* der gøres, men *hvordan* det gøres

Den historiske udvikling

- Kontekst: de historiske evolution af ideerne om interaktionens og HCI teknologien
- Hvorfor vælger Dourish et historisk perspektiv?
- Var computeren en evolution eller en revolution ?
- Fokus på færdigheder (skills) gennem fire interaktionsformer
  - electrical - textual
  - symbolic - graphical

Electrical

- Computeren var ikke en revolution, men en evolution
- Hvad ser I på billedet?

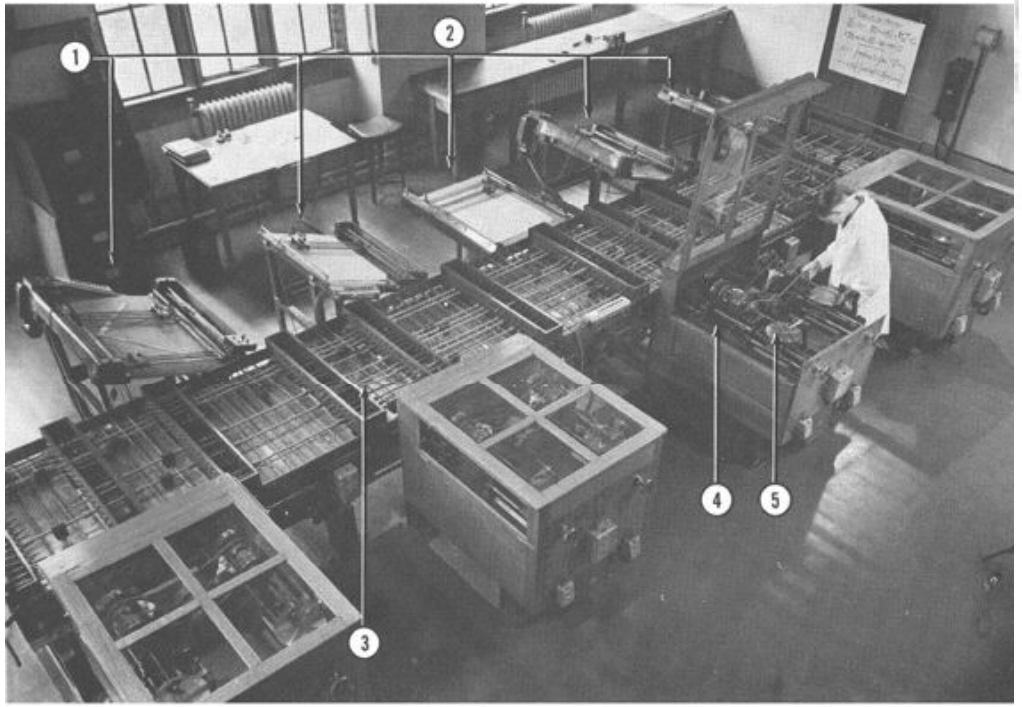
- Analog beregningstradition
  - vejrudsigter
  - skydetabeller
  - planlægning af vandledninger
  - styring af jernbanegods
  - folketælling
- Administrativ databehandling baseret på hulkort

25. Computing room at the U.S. Department of Agriculture

Kender i Vannevar Bush: As We May Think? (1945)

http://www.theatlantic.com/doc/194507/bush

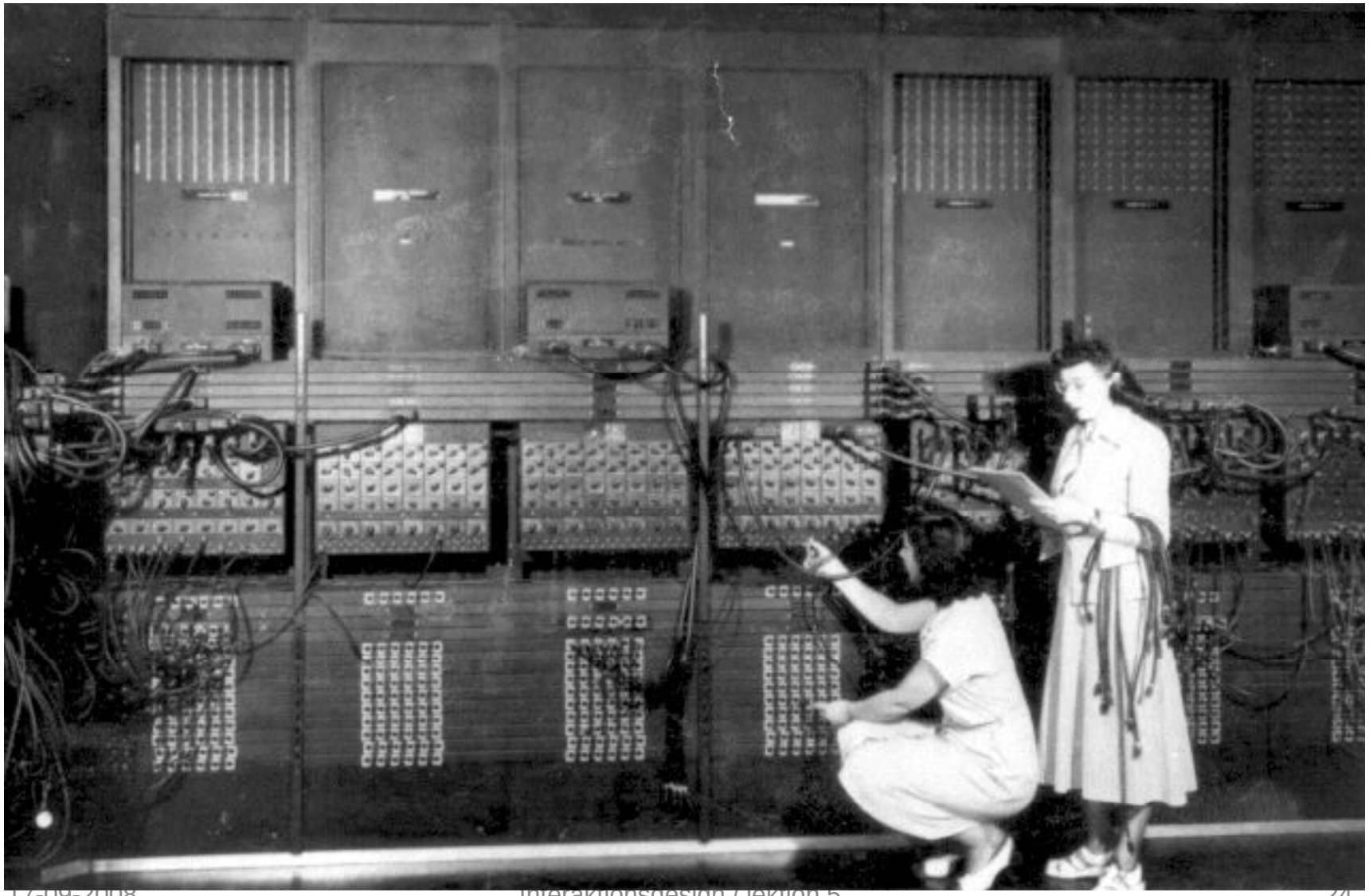
Differential Analyzer



1 Input table
2 Output table
3 Shafts and gears used for interconnection
4 Torque amplifier
5 Integrator disk

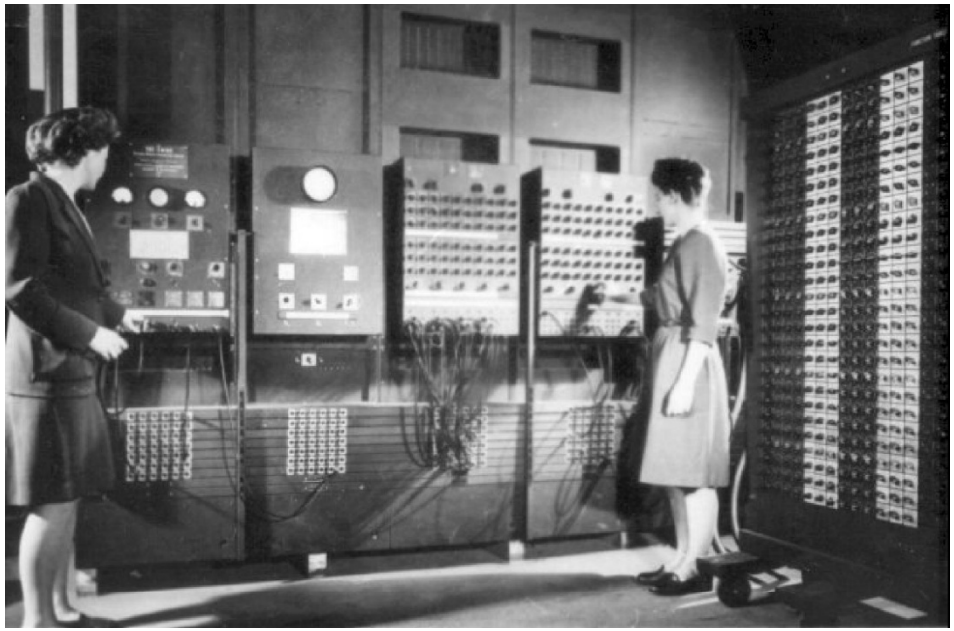
Fig. 10—Bush testing the Profile Tracer near the reservoir at Tufts College.

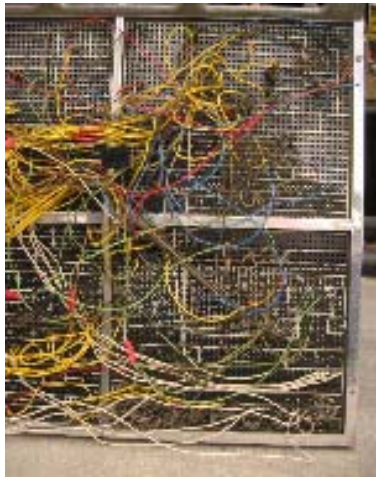
Electrical: ENIAC 1945



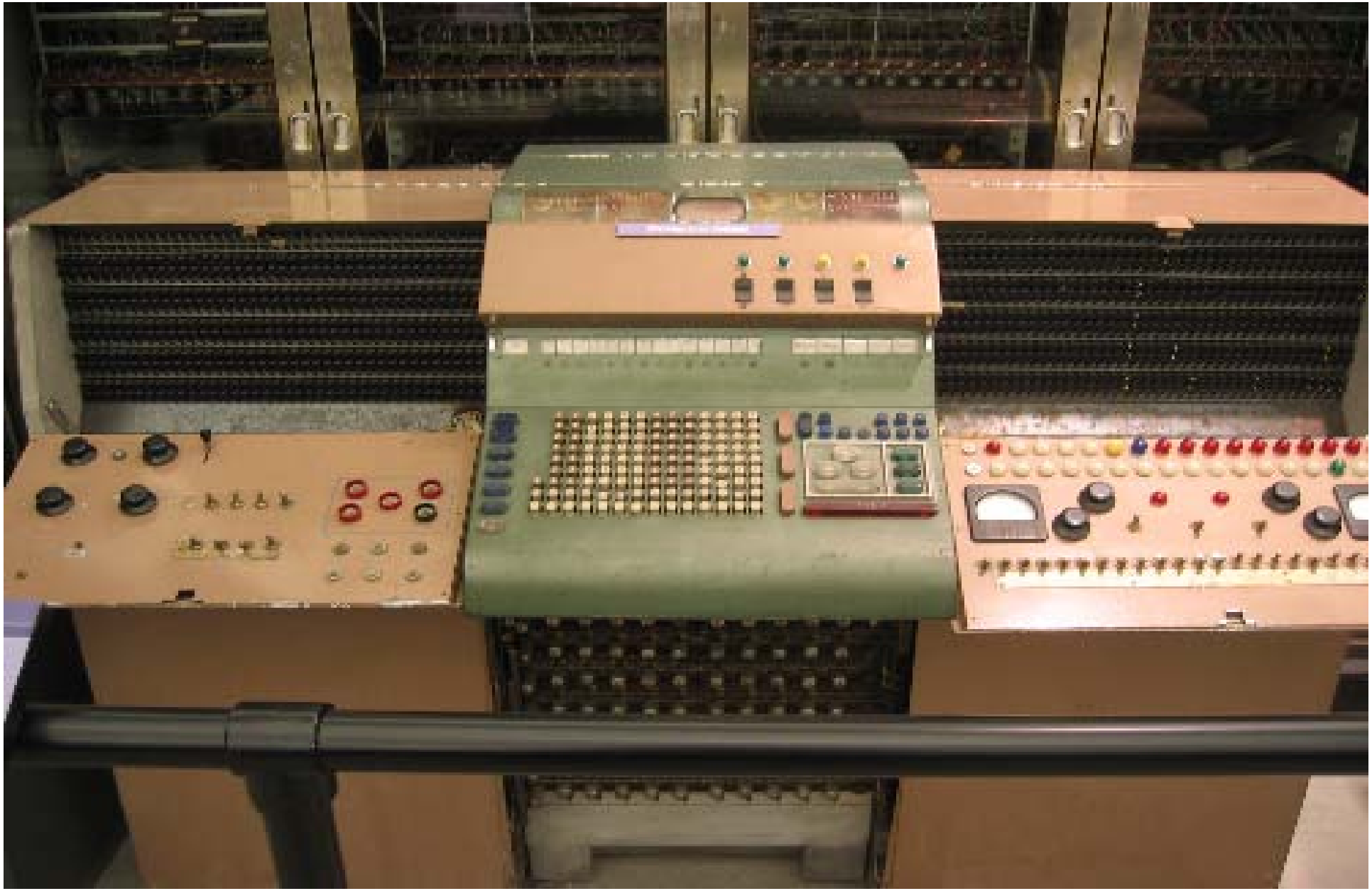
Electrical

- Plugboard programming - maskinnært
- Electrodata 101, 1958
- Før & efter stored program computer
- Skills: at bruge maskinen krævede indgående kendskab til dens elektroniske design





Electrical Johnniac 1954



Symbolic

- Electrical
  - for besværligt
  - brugeren blev selv programmøren
  - brugeren kende detaljer i maskinens arkitektur
- Symbolske interaktionsformer
- Programmering
  - væk fra maskine
  - højere abstraktionsniveau
  - maskinkode a9 62 82 2c
  - assemblersprog mov (r1+), r2
  - højniveausprog

Symbolic - FORTRAN

FORTRAN: FORmula TRANslating, IBM, 1956, bruges idag

```
integer nx, s, e
      double precision a(0:nx+1, s-1:e+1)
      parameter pi = 3.14159265
c
      if (s .eq. 1) then
         do 30 i=0,nx+1
            a(i,0) = sin(pi*i/(nx+1))
            b(i,0) = sin(pi*i/(nx+1))
 30      continue
```

Symbolic - COBOL

COBOL: Common Business Language 1959 - bruges idag

```
02 SALES-FIELDS.
        03 STORE-CODE  PIC X(4)  USAGE DISPLAY.
        03 ORDER-NO    PIC X(20) USAGE DISPLAY.
        03 ORDER-DATE  PIC 9(8)  USAGE DISPLAY
        03 PAY-TERMS   PIC X(12) USAGE DISPLAY.
GET-STORE-CODE.
    DISPLAY SPACE
    MOVE SPACES TO D-STORE-CODE.
    DISPLAY 'Enter store code (or STOP): ' NO ADVANCING.
    ACCEPT D-STORE-CODE.
    IF D-STORE-CODE IS EQUAL TO 'STOP', GO TO 950-OUT.
```

Symbolic

- Skills: Vi er gode til forskellige former for symbolsk interaktion: sprog og ikke-sproglig kommunikation
- Ikoner, trafiksignaler, flag, kort, ...
- Færdigheder
  - sprog og kommunikation
  - visuelle, kognitive
  - mere naturlig og intuitiv
- Fejlfinding i maskinkode, assembler og højniveausprog
  - maskinkode a9 62 82 2c
  - assemblersprog mov (r1+), r2
  - højniveau `MOVE SPACES TO D-STORE-CODE.`

Textual

- Sproglige færdigheder - skrevet text og interaktion
- Batch-systemer
  - hulkort/strimmel, afleverede sit job ved skranke, operatør kørte det, print 1/1 - 1 dag efter
- Time-sharing systemer med terminaler
  - conversational, dialogue, interactive
  - man-computer communication / systems
  - man-machine communication
- DOS xcopy h:*.* /a /e

  Copying everything on the H drive to the current drive (implicit), with the archive attribute set (/a) and directories and subdirectories, including empty ones (/e)
- Skills: interaktion og dialog

Graphical

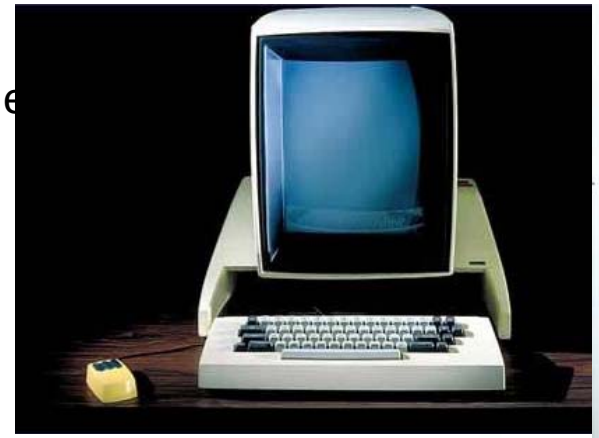
- Velkendt
- Flere færdigheder anvendes
  - perifer opmærksomhed
  - mønstergenkeldelse og rumlig tænkning
  - informationstæthed
  - visuelle metaforer
- Rum og billeder

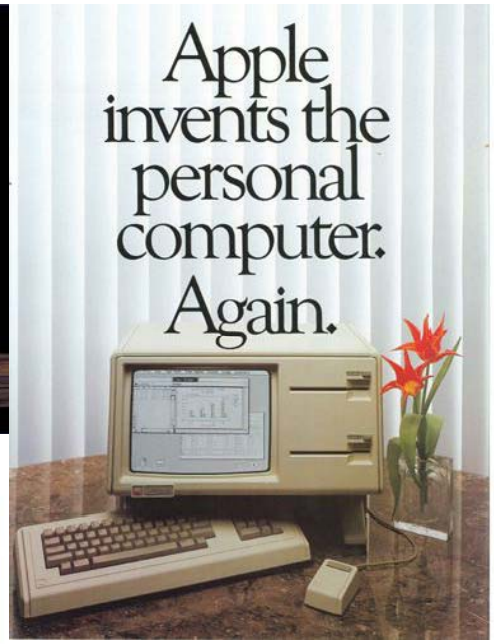
New models for interaction

Xerox Star først med vinduer, menue
og mus

Apple Lisa 1983

Apple Macintosh 1984
får fodfæste på markedet





http://www.uriahcarpenter.info/1984.html

Stort set uændret idag
men nye former

Tangible and social computing

- Tangible: tre tendenser
  - Computere i dagligdags genstande
  - Dagligdags ting "forøges/forstærkes" med computeren
  - Direkte fysisk interface istf. det grafiske - få computeren væk

- Social computing
  - increasing attempts to incorporate understandings of the social world into interactive systems
  - sociologiske, antropologiske og etnografiske tilgange
  - "single-user" paradigmet kan "forøges/forstærkes" med information om andre og omgivelserne

To Embodied Interaction

- My reason for viewing the history of interaction as a gradual expansion of human skills and abilities that can be incorporated into interacting with computers is that I beleive that it provides a valuable perspective on activities such as tangible and social computing. In particular, it shows that these two areas draw on the *same* set of skills and abilities.
- Tangible and social computing are arguably aspects of one and the same research program.
- This is the hypothesis that this book sets out to explore.
- The argument comes in four parts
  - Tangible and social computing have a common basis
  - Embodiment is the core element
  - Embodiment is not new, can be informed by phenomenology
  - Phenomenology can help provide a foundation for embodied interaction

1. Tangible and social computing have a common basis

- Draws on the way the everyday world works or - perhaps more accurately - the ways we experience the everyday world
- ... through directly interacting with the world
- They share an understanding that you cannot separate the individual from the world in which that individual lives and acts.

2. Embodiment is the core element

- Three arguments
  - interaction is intimately connected to the setting
  - turn to consider work activities and artifacts in concrete terms rather than abstract
  - the artifacts of daily interaction can play many different roles

3. Embodiment not new, informed by phenomenology

- Embodiment is not a new phenomenon - it plays a special role in a particular school of thought: phenomenology
- Phenomenology is concerned with how we perceive, experience, and act in the world around us
- Argue that the separation between mind and matter has no basis in reality
- Thinking does not occur separately from being and acting
- "See and understand " rather than "understand and see"

4. Phenomenology: a foundation for embodied interaction

- Build on the phenomenological understandings to create a foundational approach to embodied interaction.
- Such a foundation should do two things
  - Account for the ways tangible and social computing are related to each other and provide a unified model
  - Inform and support design

Fordele og ulemper ved bogen ?

- Tænk på 1-3 gode ting ved Dourish's bog
- Tænk på 1-3 ting ved Dourish's bog, som kunne være bedre

Fordele og ulemper ved bogen ?

- Tænk på 1-3 gode ting ved Dourish's bog
  - Meget stærkt indhold: et teoretisk grundlag for embodied interaction
  - Velskrevet og veldisponeret
  - Klar og forståelig trods højt abstraktionsniveau
  - Usædvanlig god metakommmunikation

- Tænk på 1-3 ting ved Dourish's bog, som kunne være bedre
  - Mere konkret: eksempler, illustrationer, cases
  - Mere design-orienteret

Summary

- What is being advocated here is an approach that, while acknowledging the contribution that different disciplines can make to the design process, ultimately depends upon the users themselves to articulate their requirements, with the system design team, composed of a variety of specialists, acting in the capacity of consultants to the project. Design teams and users must be prepared to acknowledge each others competencies .. (s. 13)

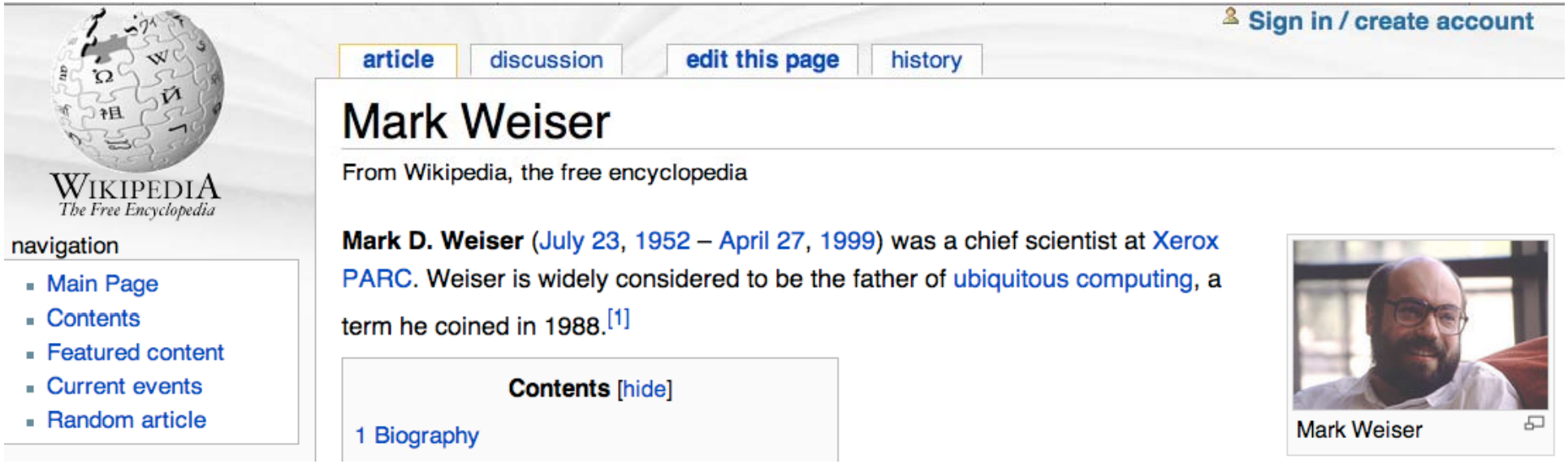
- It is in the mutual interaction of these different perspectives, including that of the end users, focused on a particular design project, that good design may emanate." (s. 13).

Mark Weiser

- The Computer for the 21st Century
- - en klassiker! … fra 1991

Hvem er Mark Weiser?

- Xerox PARC (1987-1999), chief scientist
- Considered to be the father of *ubiquitous computing* (1988)
- Outlined a set of principles of ubiquitous computing
  - The purpose of a computer is to help you do something else.
  - The best computer is a quiet, invisible servant.
  - The more you can do by intuition the smarter you are; the computer should extend your unconscious.
  - Technology should create calm.



Baggrund: 1988

- Computeren var langsomt på vej ud af kontoret og arbejdspladsen
- PC'en var ved at vinde udbredelse, men store og mellemstore computere (mainframes og minicomputere) dominerede
- Windows 1.01 1985

Calm Technology
Dangling string

Teknologien forsvinder

Teoretisk baggrund

- Herbert Simon: Compiling
- Michael Polyani: Tacit knowledge / tavs viden
- J J Gibson: visual invariants
- H G Gadamer: horisont
- M Heidegger: ready-to-hand
- J S Brown: periphery

To principper

- Location
  - skal vide hvor det er
- Scale
  - Tab: Inch (2,5 cm) (post-it note * 100)
  - Pad: Foot (30,4 cm) (A-4 papir * 10-20)
  - Board: Yard (91,4 cm) (tavle * 1-2)
- Hvis hver af disse var en computer, skulle der være hundredevis af computere i et rum

Tab - inch

Active Badge

Pad - foot

Lap-top computer (se Dourish s. 31)
’scrap’-computer / delte enheder

Board - yard

Pervasive healthcare
Activity based computing
- ABC
PiT Lab

(se Dourish s. 31)

Nødvendige teknologiske udviklinger

- Computers
- Displays
- Lageringsmedier
- OS
- Windows
- Networks
- Communication protocols

In 20 years: 2011

- Mark Weiser
  "Our computers should be like an invisible foundation that is quickly forgotton but always with us, and effortlessly used throughout our lives."

  http://ei.cs.vt.edu/~wwwbtb/fall.96/Presentations/Ubiq.ib.html

- *"Machines that fit the human environment instead of forcing humans to enter theirs will make using a computer as refreshing as talking a walk in the woods"* (214)

- Er vi der om tre år?

Pause

Sharp: chapter 6:
Interfaces and interactions

Overview

- Introduce the notion of a paradigm
- Provide an overview of the many different kinds of interfaces
- Highlight the main design and research issues for each of the different interfaces
- Consider which interface is best for a given application or activity

Paradigms

- A particular approach that has been adopted by a scientific community in terms of shared assumptions, concepts, values and practices (Kuhn)
  - Questions to be asked and how they should be framed
  - Phenomena to be observed
  - How findings from experiments are to be analyzed and interpreted

Paradigms in HCI

- The predominant 80s paradigm was to design user-centred applications for the single user on the desktop
- Shift in thinking occurred in the mid 90s:
  - beyond the desktop
  - out of the offices, away from the workplaces
  - design for communication and social setting
- Technological advances led to a new generation of user–computer environments
  - virtual reality, multimedia, agent interfaces, ubiquitous computing (ubicomp), embedded
- Moving ‘beyond the desktop’ resulted in many new challenges, questions, and phenomena

Ubicomp

- Would radically change the way people think about and interact with computers
- Computers would be designed to be embedded in the environment
- Major rethink of what HCI is in this context

New thinking

- How to enable people to access and interact with information and communicate in their work, social, and everyday lives
- Designing user experiences for people using interfaces that are part of the environment with no controlling devices
- What form to provide contextually-relevant information to people at appropriate times and places
- Ensuring that information, that is passed around via interconnected displays, devices, and objects, is secure and trustworthy

Interface types - overview

1980s interfaces

- Command
- Menu
- WIMP/GUI

1990s interfaces

- Advanced graphical
  - multimedia
  - virtual reality
  - information visualization
- Web
- Speech/voice
- Pen, gesture, and touch
- Appliance

2000s interfaces

- Mobile
- Multimodal
- Shareable
- Tangible
- Augmented & mixed reality
- Wearable
- Robotic

Hvad er det/de aktuelle paradigmer?

Interface and interaction template

- The interface
  - features
  - examples

- Research and Design Issues
  - what do we know
  - what do we not know
  - what questions arise

Command interfaces

- Commands such as abbreviations (e.g., ls) typed in at the prompt to which the system responds (e.g., listing current files)
- Some are hard wired at keyboard, e.g., delete
- Efficient, precise, and fast
- Large overhead to learning set of commands

WIMP/GUI interfaces

- Xerox Star first WIMP -> rise to GUIs
- Windows
  - could be scrolled, stretched, overlapped, opened, closed, and moved around the screen using the mouse
- Icons
  - represented applications, objects, commands, and tools that were opened when clicked on
- Menus
  - lists of options that could be scrolled through and selected
- Pointing device
  - a mouse controlling the cursor as a point of entry to the windows, menus, and icons on the screen

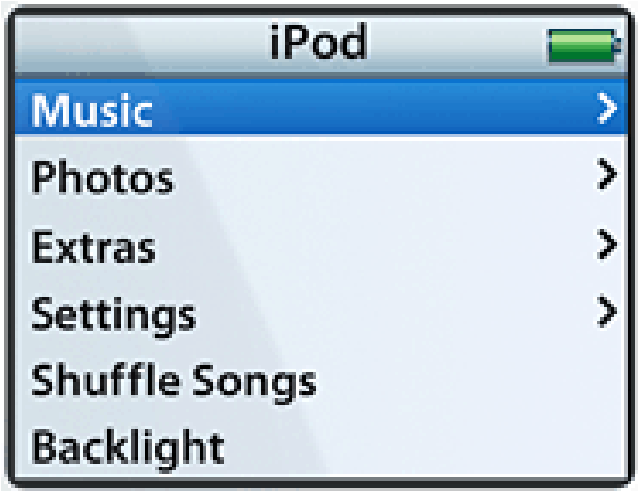
GUIs

- Graphical User Interface
- Same basic building blocks as WIMPs but more varied
  - Color, 3D,sound, animation,
  - Many types of menus, icons, windows
- New graphical elements, e.g.,
  - toolbars, docks, rollovers

Windows

- Windows were invented to overcome physical constraints of a computer display, enabling more information to be viewed and tasks to be performed
- Scroll bars within windows also enable more information to be
- Multiple windows can make it difficult to find desired one, so techniques used
  - Listing, iconising, shrinking

iPod flat menu structure



Expanding menus

- Enables more options to be shown on a single screen than is possible with a single flat menu
- More flexible navigation, allowing for selection of options to be done in the same window
- Most popular are cascading ones
  - primary, secondary and even tertiary menus
  - downside is that they require precise mouse control
  - can result in overshooting or selecting wrong options

Contextual menus

- Provide access to often-used commands that make sense in the context of a current task
- Appear when the user presses the Control key while clicking on an interface element
  - e.g., clicking on a photo in a website together with holding down the Control key results in options ‘open it in a new window,’ ‘save it,’ or ‘copy it’
- Helps overcome some of the navigation problems associated with cascading menus

Icon design

- Icons are assumed to be easier to learn and remember than commands
- Can be designed to be compact and variably positioned on a screen
- Now populate every application and operating system
  - represent desktop objects, tools (e.g., paintbrush), applications (e.g., web browser), and operations (e.g., cut, paste, next, accept, change

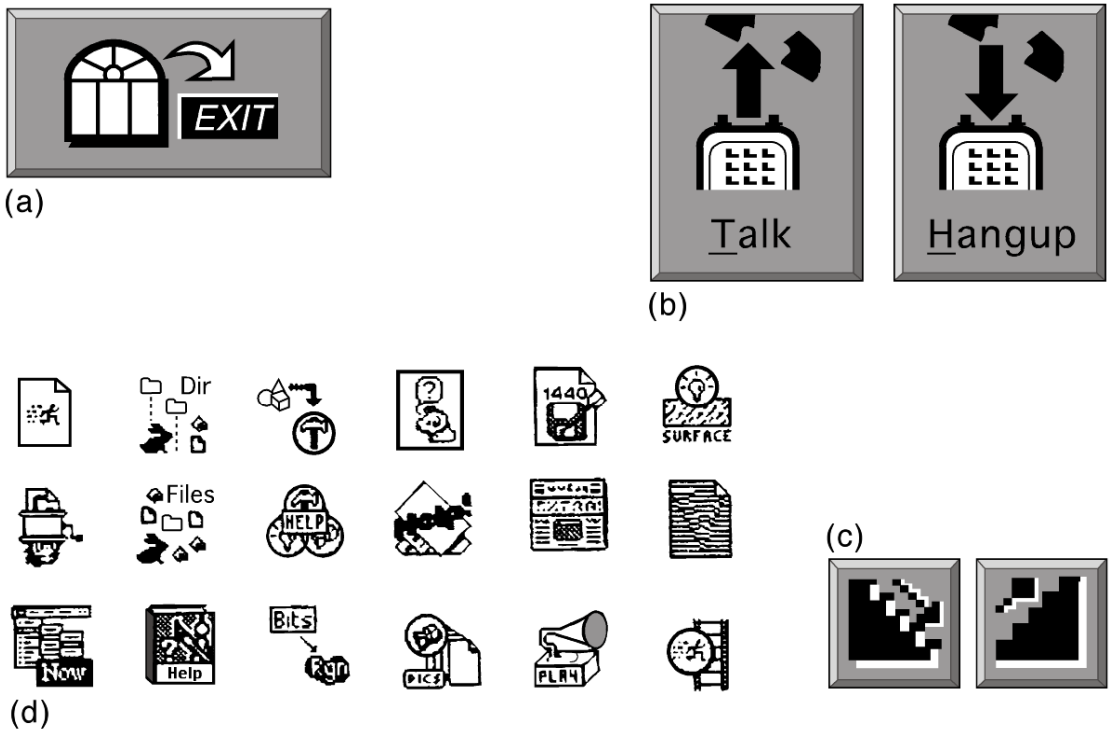
Icons

- Since the Xerox Star days icons have changed in their look and feel:
  - black and white -> color, shadowing, photorealistic images, 3D rendering, and animation
- Many designed to be very detailed and animated making them both visually attractive and informative
- GUIs now highly inviting, emotionally appealing, and feel alive

Icon forms

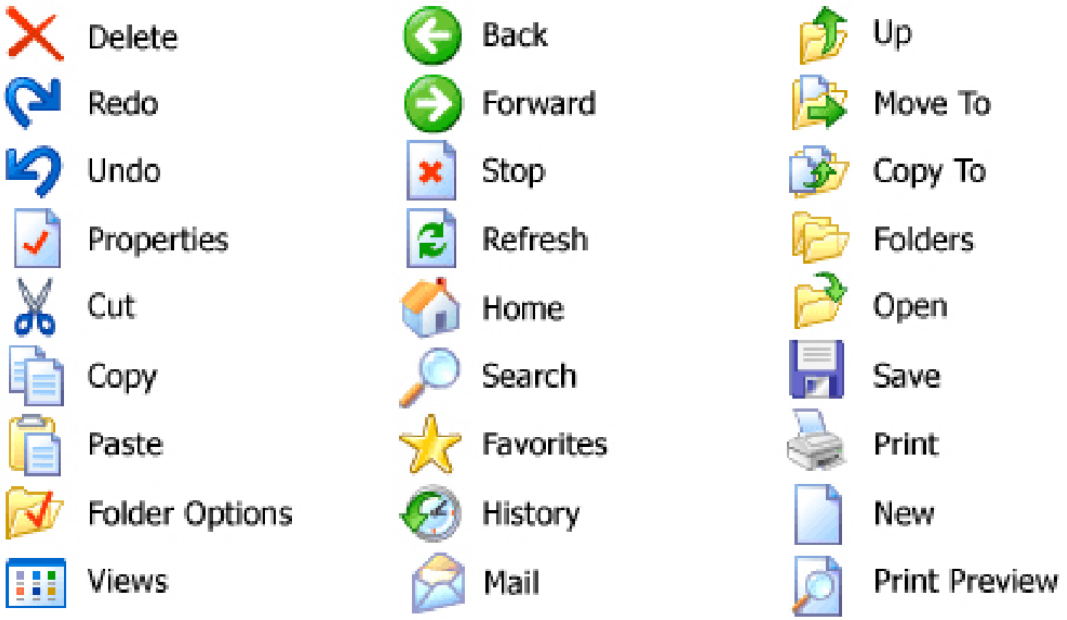
- The mapping between the representation and underlying referent can be:
  - similar: a picture of a file to represent the object file
  - analogical: a picture of a pair of scissors to represent ‘cut’
  - arbitrary: the use of an X to represent ‘delete’
- Most effective icons are similar ones
- Many operations are actions making it more difficult to represent them
  - use a combination of objects and symbols that capture the salient part of an action

Early icons


EXIT
(a)
Talk
Hangup
(b)
Dir
1440
SURFACE
Files
HELP
Help
Bits
PICS
PLAY
(d)
(c)

Newer icons

Icons + labels: Visualizers & verbalizers



Interface types

1980s interfaces
- Command
- Menu
- WIMP/GUI

➜ 1990s interfaces
- Advanced graphical
  - multimedia
  - virtual reality
  - information visualization
- (Web)
- Speech/voice
- Pen, gesture, and touch
- Appliance

2000s interfaces
- Mobile
- Multimodal
- Shareable
- Tangible
- Augmented & mixed reality
- Wearable
- Robotic

Advanced graphical interfaces

- Advanced graphical interfaces exist now that extend how users can access, explore, and visualize information
  - e.g. interactive animations, multimedia, virtual environments, and visualizations
- Some designed to be viewed and used by individuals
- Others by users who are co-located or at a distance

Multimedia

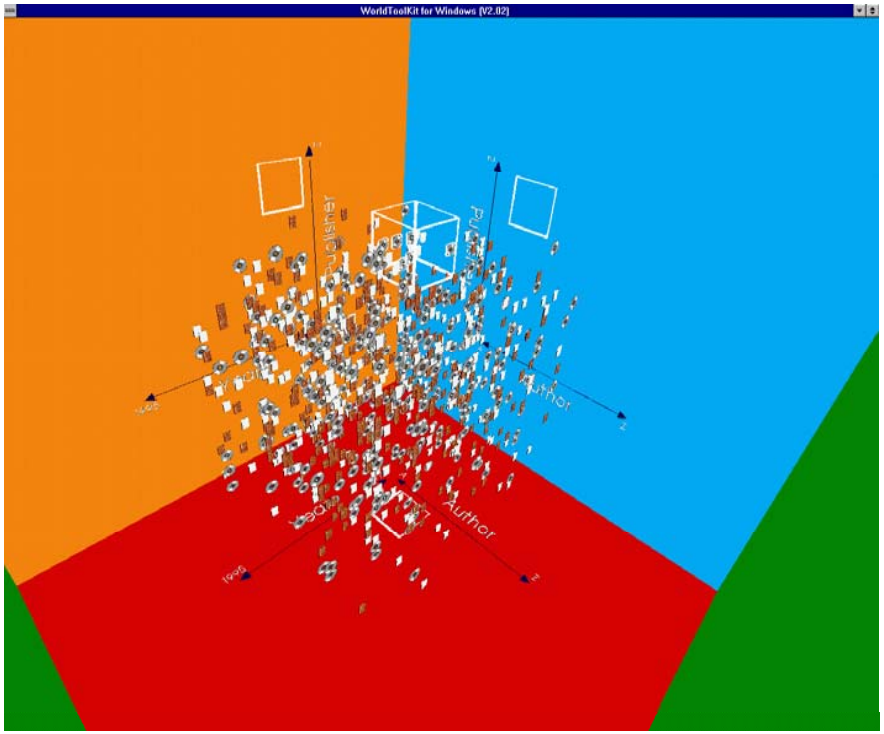
- Combines different media within a single interface with various forms of interactivity
  - graphics, text, video, sound, and animations
- Users click on links in an image or text
  -> another part of the program
  -> an animation or a video clip is played
  -> can return to where they were or move on to another place

Virtual reality and virtual environments

- Computer-generated graphical simulations providing:
  - “the illusion of participation in a synthetic environment rather than external observation of such an environment” (Gigante, 1993)
- Provide new kinds of experience, enabling users to interact with objects and navigate in 3D space
- Create highly engaging user experiences

Tilbage i 90’erne:
det virtuelle bibliotek

HMD fra Virtual Research: 3000$, opløsning på 479 x 234 pixels. 3D-mus og tracker.



Et eksempel på swarm-mode i Det virtuelle Bibliotek

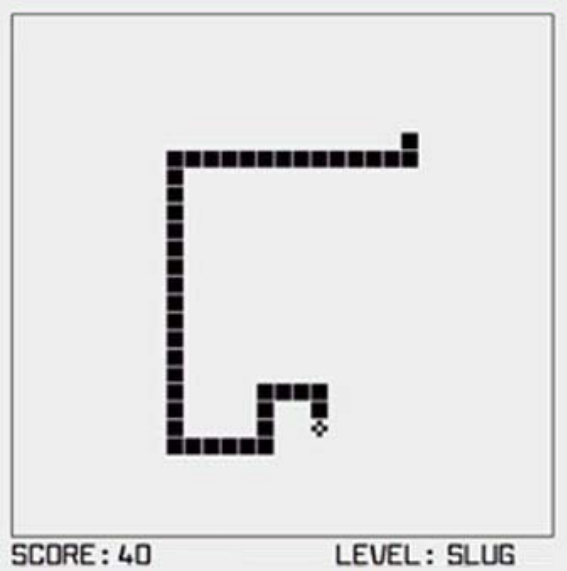
Pros and cons

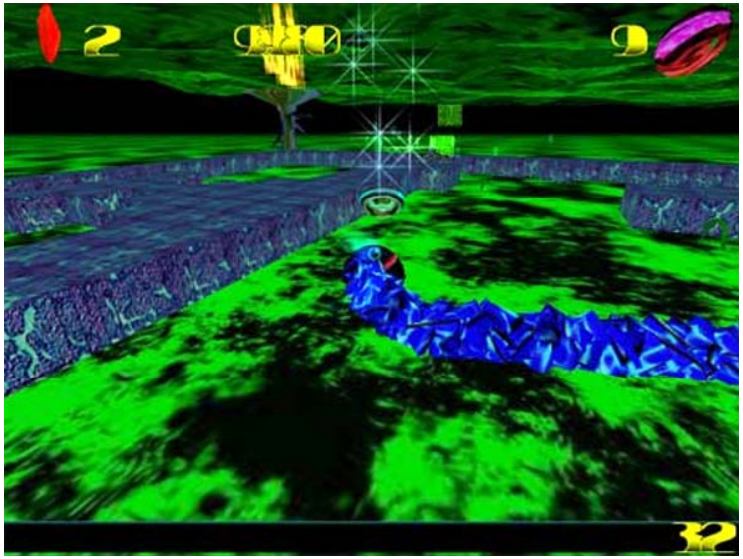
- Can have a higher level of fidelity with the objects they represent, c.f. multimedia
- Induces a sense of presence where someone is totally engrossed by the experience
  - "a state of consciousness, the (psychological) sense of being in the virtual environment" (Slater and Wilbur, 1999)
- Provides different viewpoints: 1st and 3rd person
- Head-mounted displays are uncomfortable to wear, and can cause motion sickness and disorientation

Research and design issues

- Much research on how to design safe and realistic VRs to facilitate training
  - e.g., flying simulators
  - help people overcome phobias (e.g., spiders, talking in public)
- Design issues
  - how best to navigate through them (e.g., first versus third person)
  - how to control interactions and movements (e.g., use of head and body movements)
  - how best to interact with information (e.g., use of keypads, pointing, joystick buttons);
  - level of realism to aim for to engender a sense of presence

Which is the most engaging game of Snake?





Web interfaces

- Early websites were largely text-based, providing hyperlinks
- Concern was with how best to structure information at the interface to enable users to navigate and access it easily and quickly
- Nowadays, more emphasis on making pages distinctive, striking, and pleasurable

Useit.com

useit.com: Jakob Nielsen's Website

Permanent Content

Alertbox
Jakob's column on Web usability

Fast, Cheap, and Good Usability Methods (Jan. 2)
The sooner you complete a usability study, the higher its impact on the design process. Slower methods should be deferred to an annual usability checkup.

Usability in the Movies (Dec. 18)
Progressive Disclosure (Dec. 4)
Digital Divide (Nov. 20)

All Alertbox columns from 1995 to 2007

Sign up for newsletter by email when a new Alertbox is published

Reports

Intranet usability
- Intranet design annual
- Enterprise portals

News

Usability Week 2007 Conference

- Hong Kong, March 5-9
- Washington, D.C., April 22-27
- London, May 6-11
- San Francisco, June 18-23

3-day camp: usability in practice
3-day immersion: interaction design

Ten full-day tutorials, including two new days on application usability:
- Page-level building blocks
- Dialogue and workflow design

Specialized topics from intranet usability over email newsletter design to writing for the Web.

News.com Yahoo's IM update: A trojan horse of surprises

Newsweek Moving Into a New Office

Swim

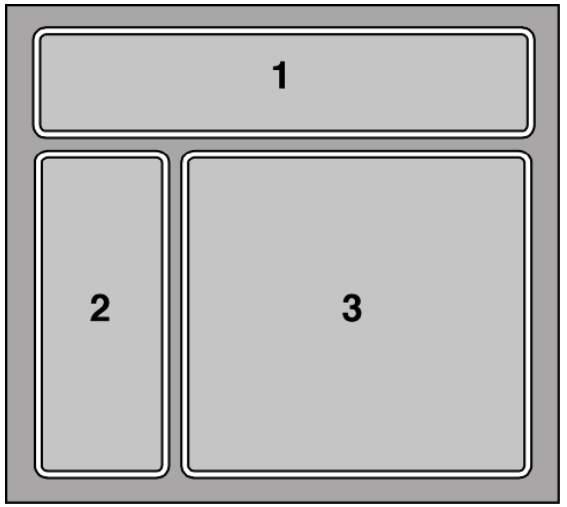

swim
about
portfolio
news
people
jobs
contact
wireless
medical devices
enterprise software
handhelds
appliances
web apps
They're everywhere.
We think yours should stand out.
Today, devices and applications are an integral part of your customer's lives and businesses. Providing a high quality interactive experience will distinguish your product and ensure its acceptance and use.
For almost 10 years Swim has helped companies like yours design clear interfaces and make powerful functionality accessible. Let us know how we can help you.
© 2006 Swim Interaction Design Studio LLC

Usability versus attractiveness debate

- Vanilla or multi-flavor design?
  - Ease of finding something versus aesthetic and enjoyable experience
- Web designers are:
  - “thinking great literature”
- Users read the web like a:
  - “billboard going by at 60 miles an hour” (Krug, 2000)
- Need to determine how to brand a web page to catch and keep ‘eyeballs’

Research and design issues

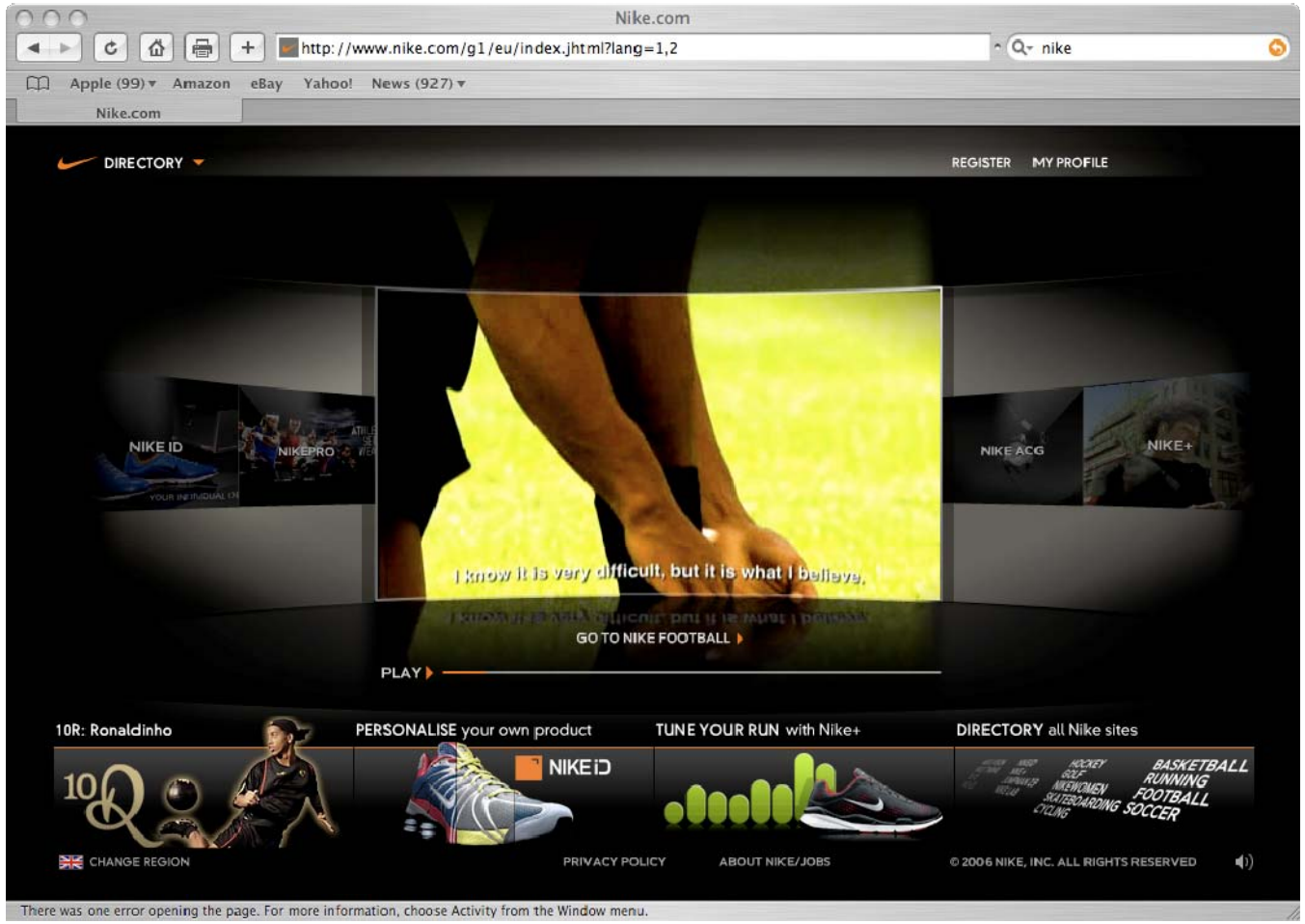
- Web interfaces are getting more like GUIs
- Need to consider how best to design, present, and structure information and system behavior
- But also content and navigation are central
- Veen's design principles
- (1) Where am I?
  (2) Where can I go?
  (3) What's here?



Activity

- Look at the Nike.com website
- What kind of website is it?
- How does it contravene the design principles outlined by Veen?
- Does it matter?
- What kind of user experience is it providing for?
- What was your experience of engaging with it?

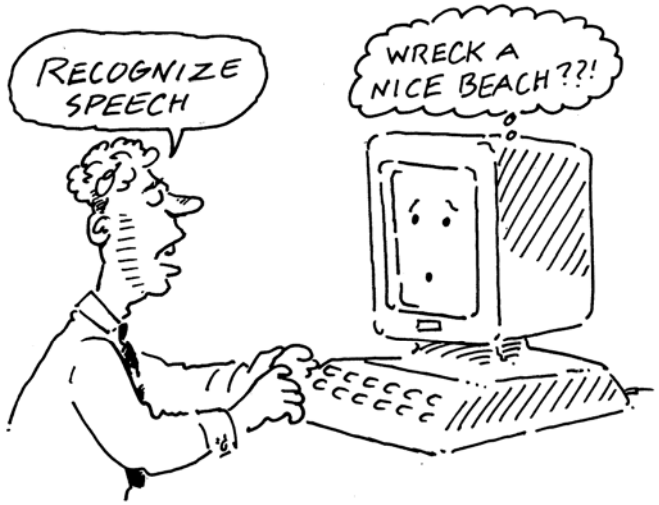
Nike.com


Nike.com
http://www.nike.com/g1/eu/index.jhtml?lang=1,2
nike
Apple (99)
Amazon
eBay
Yahoo!
News (927)
Nike.com
DIRECTORY
REGISTER
MY PROFILE
NIKE ID
NIKEPRO
NIKE ACG
NIKE+
I know it is very difficult, but it is what I believe.
GO TO NIKE FOOTBALL
PLAY
10R: Ronaldinho
PERSONALISE your own product
NIKEiD
TUNE YOUR RUN with Nike+
DIRECTORY all Nike sites
BASKETBALL
RUNNING
FOOTBALL
SOCCER
CHANGE REGION
PRIVACY POLICY
ABOUT NIKE/JOBS
© 2006 NIKE, INC. ALL RIGHTS RESERVED
There was one error opening the page. For more information, choose Activity from the Window menu.

Speech interfaces

- Where a person talks with a system that has a spoken language application, e.g., timetable, travel planner
- Used most for inquiring about very specific information, e.g., flight times or to perform a transaction, e.g., buy a ticket
- Also used by people with disabilities
  - e.g., speech recognition word processors, page scanners, web readers, home control systems

Have speech interfaces come of age?



Get me a human operator!

- Most popular use of speech interfaces currently is for call routing
- Caller-led speech where users state their needs in their own words
  - “I’m having problems with my voice mail”
- Idea is they are automatically forwarded to the appropriate service
- What is your experience of such systems?

Format

- Directed dialogs are where the system is in control of the conversation
- Ask specific questions and require specific responses
- More flexible systems allow the user to take the initiative:
  - “I’d like to go to Paris next Monday for two weeks.”
- More chance of error, since caller might assume that the system is like a human
- Guided prompts can help callers back on track
  - “Sorry I did not get all that. Did you say you wanted to fly next Monday?”

Research and design issues

- How to design systems that can keep conversation on track
  - help people navigate efficiently through a menu system
  - enable them to easily recover from errors
  - guide those who are vague or ambiguous in their requests for information or services
- Type of voice actor (male, female, neutral, or dialect)
  - Do people prefer to listen to and are more patient with a female or male voice, a northern or southern accent?

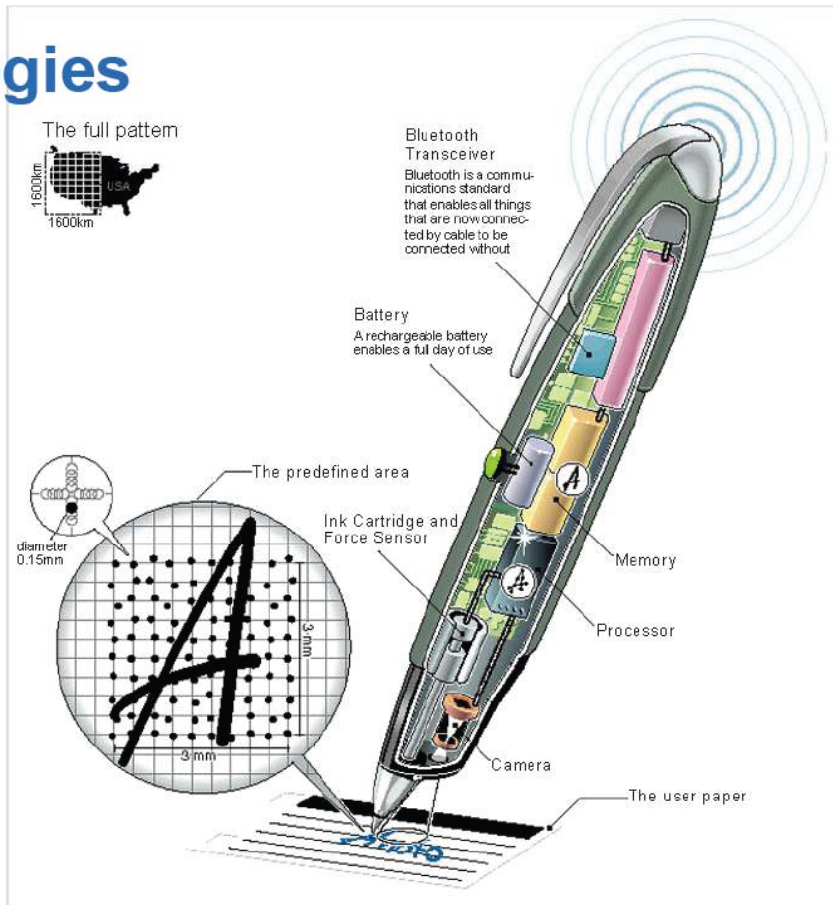
Paperworks

Augmenting pen and paper

Anoto Technologies

virtual paper space of 60 million km²

Pen manufacturers
Sony Ericsson
Logitech
Nokia
Maxell



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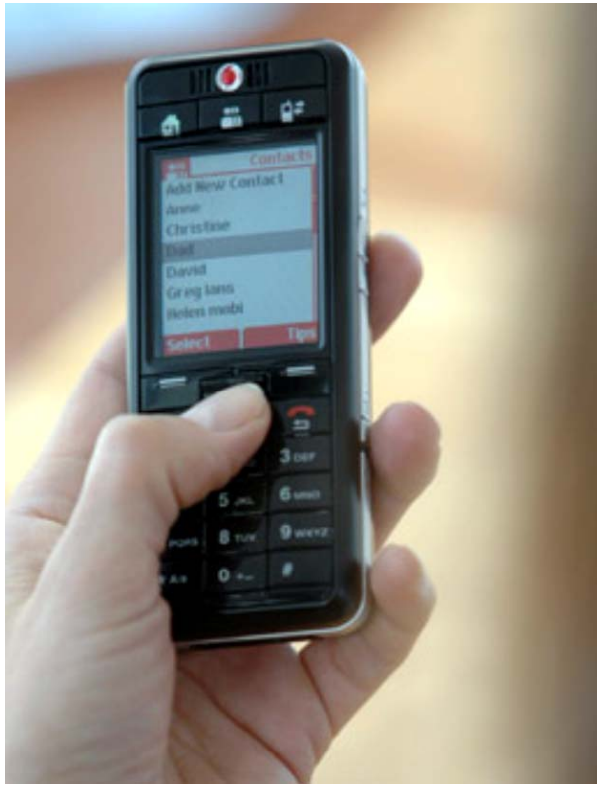
Mobile interfaces

- Handheld devices intended to be used while on the move, e.g., PDAs, cell phones
- Applications on handhelds have greatly expanded
  - used in restaurants to take orders
  - car rentals to check in car returns
  - supermarkets for checking stock
  - in the streets for multi-user gaming
  - in education to support life-long learning

Mobile challenges

- Small screens, small number of keys and restricted number of controls
- Innovative designs including:
  - roller wheels, rocker dials, up/down ‘lips’ on the face of phones, 2-way and 4-way directional keypads, softkeys, silk-screened buttons
- Usability and preference for these control devices varies
  - depends on the dexterity and commitment of the user

Simple or complex phone for you and your grandmother?



Research and design issues

- Despite many advances mobile interfaces can be tricky and cumbersome to use
- Especially for those with poor manual dexterity or ‘fat’ fingers
- Key concern is designing for small screen real estate and limited control space

Shareable interfaces

- Shareable interfaces are designed for more than one person to use
  - provide multiple inputs and sometimes allow simultaneous input by co-located groups
  - large wall displays where people use their own pens or gestures
  - interactive tabletops where small groups interact with information using their fingertips, e.g., Mitsubishi's DiamondTouch and Sony's Smartskin

Touch table

- A Master Thesis Project About a Design Exploration Using Multi-Touch-based Tabletops for Seniors: http://rasimu.dk/thesis/

Advantages

- Provide a large interactional space that can support flexible group working
- Can be used by multiple users
  - can point to and touch information being displayed
  - simultaneously view the interactions and have same shared point of reference as others
- Can support more equitable participation compared with groups using single PC

Research and design issues

- More fluid and direct styles of interaction involving freehand and pen-based gestures
- Core design concerns include whether size, orientation, and shape of the display have an effect on collaboration
- horizontal surfaces compared with vertical ones support more turn-taking and collaborative working in co-located groups
- Providing larger-sized tabletops does not improve group working but encourages more division of labour

Tangible interfaces

- Type of sensor-based interaction, where physical objects, e.g., bricks, are coupled with digital representations
- When a person manipulates the physical object/s it causes a digital effect to occur, e.g. an animation
- Digital effects can take place in a number of media and places or can be embedded in the physical object

-> mere i lektion 14 om Tangible computing

Wearable interfaces

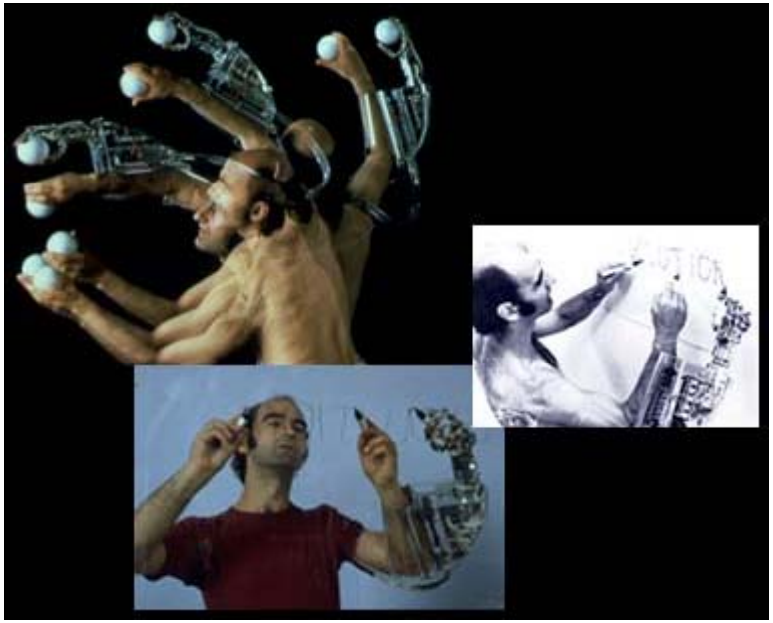
- First developments was head- and eyewear-mounted cameras that enabled user to record what seen and to access digital information
- Since, jewelery, head-mounted caps, smart fabrics, glasses, shoes, and jackets have all been used
  - provide the user with a means of interacting with digital information while on the move
- Applications include automatic diaries and tour guides

Steve Mann - pioneer of wearables

Stelarc: The third hand

www.stelarc.va.com.au

(cyborgs / artist)



Research and design issues

- Comfort
  - needs to be light, small, not get in the way, fashionable, and preferably hidden in the clothing
- Hygiene
  - is it possible to wash or clean the clothing once worn?
- Ease of wear
  - how easy is it to remove the electronic gadgetry and replace it?
- Usability
  - how does the user control the devices that are embedded in the clothing?

Robotic interfaces

- Four types
  - remote robots used in hazardous settings
  - domestic robots helping around the house
  - pet robots as human companions
  - sociable robots that work collaboratively with humans, and communicate and socialize with them – as if they were our peers

Advantages

- Pet robots have therapeutic qualities, being able to reduce stress and loneliness
- Remote robots can be controlled to investigate bombs and other dangerous materials

Research and design issues

- How do humans react to physical robots designed to exhibit behaviors (e.g., making facial expressions) compared with virtual ones?
- Should robots be designed to be human-like or look like and behave like robots that serve a clearly defined purpose?
- Should the interaction be designed to enable people to interact with the robot as if it was another human being or more human-computer-like (e.g., pressing buttons to issue commands)?

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- Robotic

Which interface?

- Is multimedia better than tangible interfaces for learning?
- Is speech as effective as a command-based interface?
- Is a multimodal interface more effective than a monomodal interface?
- Will wearable interfaces be better than mobile interfaces for helping people find information in foreign cities?
- Are virtual environments the ultimate interface for playing games?
- Will shareable interfaces be better at supporting communication and collaboration compared with using networked desktop PCs?

Which interface?

- Will depend on task, users, context, cost, robustness, etc.
- Much system development will continue for the PC platform, using advanced GUIs, in the form of multimedia, web-based interfaces, and virtual 3D environments
  - Mobile interfaces have come of age
  - Increasing number of applications and software toolkits available
  - Speech interfaces also being used much more for a variety of commercial services
  - Appliance and vehicle interfaces becoming more important
  - Shareable and tangible interfaces entering our homes, schools, public places, and workplaces

Summary

- Many innovative interfaces have emerged post the WIMP/GUI era, including speech, wearable, mobile, and tangible
- Many new design and research questions need to be considered to decide which one to use
- Web interfaces are becoming more like multimedia-based interfaces
- An important concern that underlies the design of any kind of interface is how information is represented to the user so they can carry out ongoing activity or task

Øvelse 5

Slut