Human Computer Interaction (HCI)

Designing Interactive systems

Lecture 1

dr Kristina Lapin
Objectives

- The variety of interactive systems
- Evolution
- Concerns of interactive system design
- Course requirements
- Learning resources
Aims

• The variety of interactive systems
• The concerns of interactive systems
• Evolution
• Being digital
• The skills of interactive systems designed
• Importance of human computer interaction
Smart phones

• 2007: iPhone
  – Touch screen
  – Multi-touch input
  – New ways of interaction
    • Pinching for zooming
    • Sensors how phone is held
      – Portrait, landscape styles
  – iTunes delivery service
Desktop systems
Virtual reality
Immersive technologies

Games
Virtual Worlds
Social Networks
Virtual worlds

Second life is a huge on-line community populated by animated virtual people (avatars). Consists of simulated islands with parks, buildings, etc. People create the avatars to represent themselves.
Ambient technologies

http://www.youtube.com/watch?v=2Ixhr2n0aPyw&feature=player_embedded
Domestic toy robot i Robo Q

- moves freely around the house
- reacts to voice commands,
- monitors its surroundings with a surveillance camera and takes pictures
- teaches children languages,
- plays games,
- provides the weather forecast, news and recipes.

Photographed at a robot exhibition in Seoul, South Korea.
Social networks

Facebook padeda jums susisiekti su draugais ir dalintis savo gyvenimu.

Registracija
Nemokamas dabar ir visados.

Vardas

Pavardė

El. paštas

Įvesk el. pašto adresą dar kartą

Naujas slaptazodis

Gimimo data

Moteris

Vyras

Pripažindami Registraciją, jūs sutinkate su mūsų Baltijos ir kai kuriuose pasaulio šalyse veikiančiuose mūsų Data Use Policy, pirkant mūsų Cookie Use.
Various user interfaces

What do the interfaces consist of?
Gesture interaction: Nintendo Wii
EVOLUTION OF HCI
Vannevar Bush “As We May Think”

- Memex: analog hypertext

1890 – 1974
ENIAC, 1946
Electronic Numerical Integrator And Computer

Grace Hopper – the inventor of compiler

- Compiler improved usability
- A-0: Arithmetic Language version 0; 1951-1952
- COBOL, 1959
First interactive screens

1960-ties: data stored in paper tape or cards with holes punched in them. Cards were sent to computer centre, data was processed, results printed.

• Joseph C.R. Licklider
  the first screens and cathode ray tubes (CRT)
Direct interaction with computer

- Ivan Sutherland (MIT),
- Sketchpad, 1962
  - It could draw both horizontal and vertical lines and combine them into figures and shapes. Figures could be copied, moved, rotated, or resized, retaining their basic properties.
- Input: light pen
- Output: cathode ray tube

http://www.youtube.com/watch?v=USyoT_Ha_bA
Computer mouse

- Douglas Engelbart, 1968
- Demonstrated the interaction using the mouse at The Mother of All Demos

http://sloan.stanford.edu/mousesite/1968Demo.html#complete, clip 12
1970-ties: people at the center

- Technology at the focus of design
  - batch interaction, command line interface

- Alan Kay
  - Dynabook: concept of laptop
  - Object-oriented programming, SmallTalk
  - People at the center of design
Graphical user interface

• XEROX STAR, 1981
• Office metaphor
  – windows, icons, folders
  – Ethernet network,
  – file server,
  – print server,
  – email
• microcomputers

http://www.youtube.com/watch?v=Cn4vC80Pv6Q
1990 ties: multimedia

- 1993: hypertext
- World Wide Web revolutionized the process of transmitting and sharing files.
  - Pictures, movies, music, text and even live video links were available to everyone
- 1993: Mark Weizer, ubiquitous computing
  - Mobile devices and available Internet
Evolution of HCI

- 40–ties – vision, Vannevar Bush
- 50-ties – compilers, Grace Hoper
- 60-ties – Sketchpad, Ivan Sutherland
- 70-ties – Dynaburg, Alan Kay
- 80-ties – XEROX Star, microcomputers
- 90-ties – multimedia
- 2000-ties – mobiles
- 2010-ties - ?
Long nose of innovation, Bill Buxton

„Long Nose“ of the S-Curve

- Most successful new things were invented 20 years ago
- 30 years isn’t seldom
- So: „Any technology that is going to have significant impact over the next 10 years is already at least 10 years old.“ (Bill Buxton)
Long nose of innovation

• New products and ideas come from observing history and the evolution of the ecosystem.

• ipod took aesthetical inspiration from Dieter Rams’ Braun T3 radio, produced in 1958.
Design
Technologies
People
Activities and contexts

CONCERNS OF THE INTERACTIVE SYSTEMS DESIGN
Concerns of interactive systems design

• developing high quality interactive systems, products and services that
  – fit with people and their ways of living
The ergonomic model of HCI
ACM model of HCI
People and technologies

• *Interactive system* - the technologies that cover components, devices, products and software systems – that are primarily concerned with processing information.

• Interactive systems are things that deal with the transmission, display, storage or transformation of information that people can perceive. – They are devices and systems that respond dynamically to people’s actions.
Being human-centred

• Thinking about what people want to do rather than what the technology can do
• Designing new ways to connect people with people
• Involving people in the design process
• Designing for diversity
The process of interaction design

- Establishing requirements
- Evaluating
- Developing alternatives
- Prototyping
Save development costs

The number of possible designs decreases as the cost to make changes increases (Ehrlich and Rohn, 1994, p. 80).

COURSE REQUIREMENTS
Human-computer Interaction

• a discipline concerned with
  – the study,
  – design and
  – implementation of

• human-centric interactive computer systems.
Interaction design: fusion of skills

• Main contributors
  – Ergonomics
  – Psychology
  – Computer science
  – Sociology
Skills of interactive systems designer

• Study and understand the activities and aspirations of people and the contexts
  – within which some technology is useful
  – and generate requirements for technologies
• Know the possibilities offered by technologies
• Research and design technological solutions
  – that fit in with people, the activities they want to undertake and the contexts in which those activities occur
• Evaluate alternative designs and iterate
  – (do more research and more design) until a solution is arrived at.
Course grade structure

• Assignments – 50%
  1. User needs
  2. Alternative mockups
  3. Analytical evaluations
  4. High-fidelity prototype
  5. Usability testing

• Exam – 40%

• Minitests and peer reviews – 10%
Learning objectives

• understand how to design interactive products that fit with what people want, need and may desire

• appreciate that one size does not fit all
e.g., teenagers are very different to grown-ups

• identify any incorrect assumptions they may have about particular user groups
e.g., not all old people want or need big fonts

• be aware of both people’s sensitivities and their capabilities
Learning resources

• Course website:
  – web.vu.lt/mif/k.lapin

• Books at the MIF library
MIF library

David Benyon, Phil Turner, Susan Turner
Designing Interactive Systems: People, Activities, Contexts, Technologies,
Addison Wesley,
MIF library

- Helen Sharp, Yvonne Rogers, Jenny Preece

Interaction Design: Beyond Human-Computer Interaction
John Wiley & Sons, 2002 (20 egz.)
MIF library

- Donald A. Norman. *The Design of Everyday Things*. Basic Books; Reprint edition (September 17, 2002), 272 pages
  - Puikus ŽKS įvadas
MIF library

MIF library

• Schneiderman, B., Plaisant C. *Designing the user interface*. Addison-Wesley. 2004, 2010
MIF library

- Faulkner, Ch. The Essence of Human-Computer Interaction, Pearson Prentice Hall, 1996.
MIF library

  Julie A. Jacko (ed.) and Andrew Sears (ed.)
  Lawrence Erlbaum Associates. 2003
Other resources

- User Experience Professionals Association
- AIGA, the professional association for design
- ACM Special Interest Group CHI
- Usability Net
- Nielsen Norman Group
Human computer interaction

Kristina Lapin

web.vu.lt/mif/k.lapin/
References

  – 1 chapter: Designing interactive systems: a fusion of skills

  – 1 chapter: What is Interaction Design?