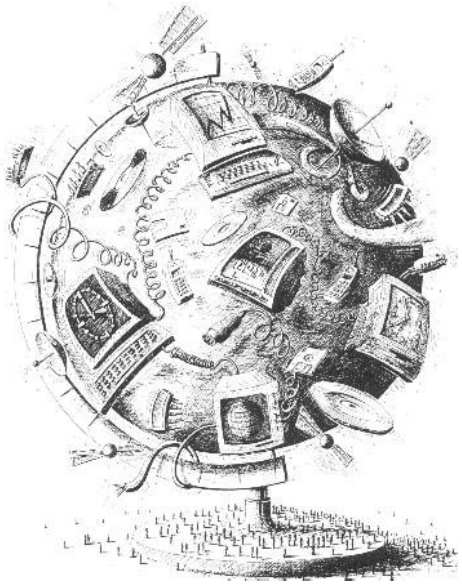
Group Work on Ubicomp Scenarios



Summer School on Ubiquitous and Pervasive Computing

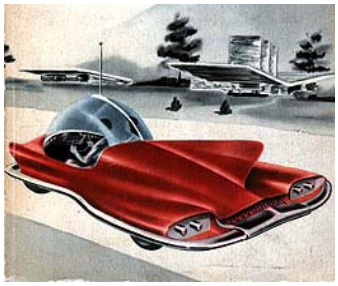
August 7-14, 2002
Schloss Dagstuhl

ETH Eidgenössische Technische Hochschule Zürich

Group Work

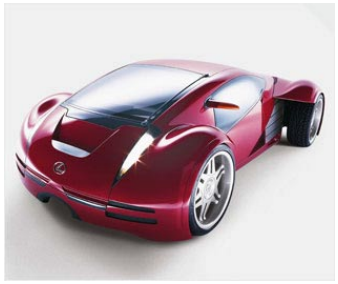
- Introduction (~10 min.)
- 20 minutes
  - short presentation by Yves Punie
  - and by Vlad Coroama
- 8 groups (of 6-7 people)
- Each group discusses and later reports on:
  a) 1 (out of 4) category of questions
  b) other (or more general) ubicomp issues
    – comment on everything that is of interest!
- After lunch (14:30): all together again
  - reports on the findings of each group
  - general discussion

Old Scenarios and Predictions



F.Ma. 5

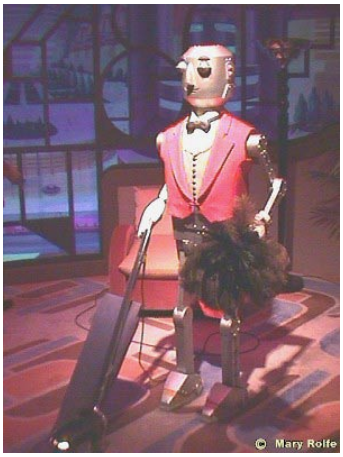
New Scenarios and Predictions



F.Ma. 6

Category 1

- What was right / wrong with older predictions and scenarios? (Why?)
- What might be wrong with today´s?
  - how do you assess the scenarios?
  - how realistic are they?



F.Ma. 7

Category 2

- How will we live in the future?
  - ~ 5-20 years
  - in a smart environment?
  - what will different spaces (home, office, education, manufacturing, entertainment) look like?

- Come up with your own scenarios
  - but be critical about them, discuss pros and cons
  - worst-case / best-case scenarios – what can, will, should happen?
  - what technical breakthroughs are needed?
  - what are your underlying assumptions concerning the non-technical issues?

F.Ma. 8

Category 3

- What are the technical and non-technical problems with ubicomp?
  - limits on ubicomp?
  - you might consider AI, dependability, privacy, usability, acceptance,...
- What are the challenges?
- What might be potential benefits?
- How do you assess the critical papers?
  - Agustin A. Araya: *Questioning Ubiquitous Computing*
  - Christopher Lueg: *On the Gap Between Vision and Feasibility*

F.Ma. 9

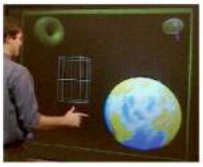
Category 4

- Consequences and impact:
- What can we learn from the scenarios?
  - what might be socially relevant?
  - what will affect everyday live?
- Other consequences?
  - e.g., political issues, educating the public, teaching Ubicomp,...
- What are important research issues?
  - short term vs. long term

F.Ma. 10

Technology-inspired Scenarios

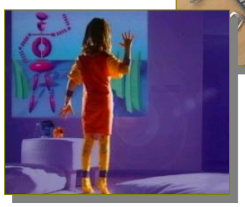
Video Walls & Virtual-Real Meetings



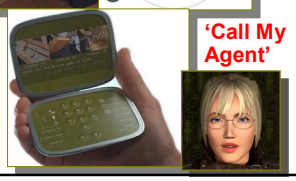
3D Design

Foldable Workstations

Workspaces in the Air



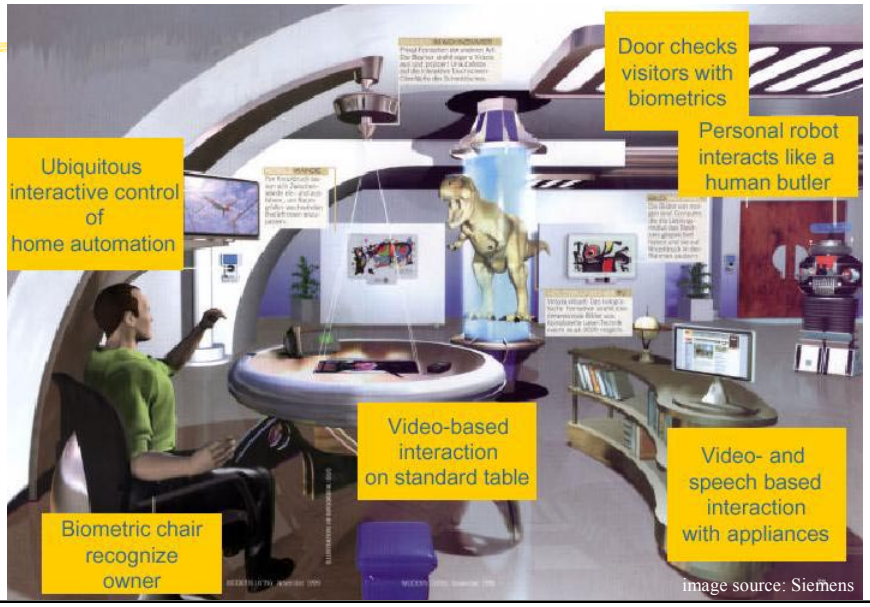
Creative Spaces



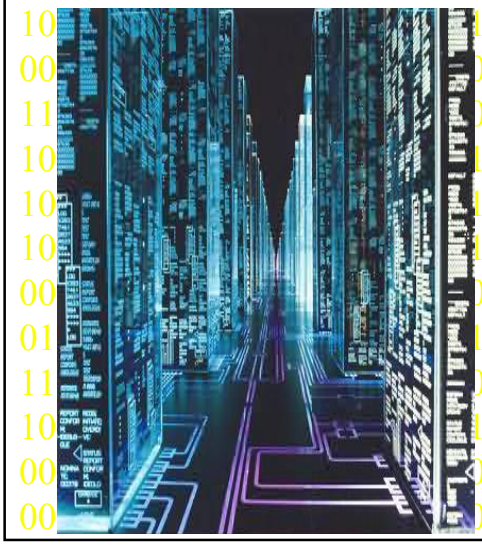
'Call My Agent'

image sources: France Telecom

Smart Home – A Realistic Scenario?

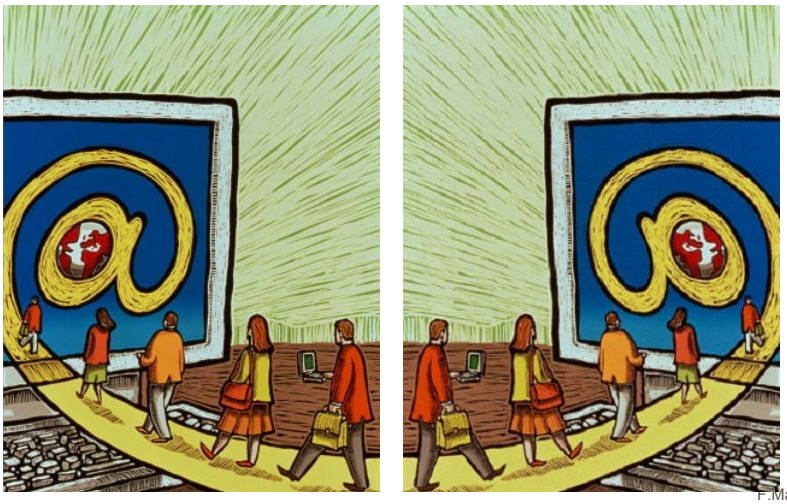


Technology Trends: Moore's Law, Going Digital,...



F.Ma. 13

Business Trends: Virtual Structures, Globalization, ...



F.Ma. 15

Societal Trends: Increased Mobility, ..., ...

F.Ma. 16

Vannevar Bush: As We May Think (1945)

- Memex
  - web of trails, tying two items together
- Mini camera
  - to support „knowledge workers"
  - little larger than a walnut, full color, hundred exposures, without audible click, wound once, pictures of 3 mm^2
- Microfilm
  - information compressed by a factor of 10000
- Hands are free, connected by radio,...
- Mass-produced advanced arithmetical machines
  - take data from a room full of girls armed with key board punches
  - deliver sheets of computed results every few minutes

F.Ma. 17

J.C.R. Licklider: Man-Computer Symbiosis (1960)

- Cooperative interaction between men and computers
- Thinking centers will incorporate the functions of libraries and information storage and retrieval
  - connected to one another by wide-band communication lines
- Read the man's writing & speech recognition
  - if computing machines are ever to be used directly by top-level decision makers, it may be worthwhile to provide communication via the most natural means

F.Ma. 18

J.C.R. Licklider, R. Taylor : The Computer as a Communication Device (1968)

- Electronic pointer controllers called „mice" (Doug Engelbart)
- Communication among people at consoles located distantly
- A service that would let one have ad lib access to a channel for short intervals and not be charged when one is not using it
- Set up an experimental network of multiaccess computers
- Feasibility of using programs at remote locations
- Security and privacy are subjects of active concern
- On-line interactive communities, not of common location but of common interest

F.Ma. 19

J.C.R. Licklider, R. Taylor : The Computer as a Communication Device (1968)

- Each secretary's typewriter, each dictation microphone will feed into the network
- You will seldom make a telephone call or a business trip
- Computer programs that reside within the network and act on behalf of its principal
- Available within the network will be functions and services which you subscribe on a regular basis and others that you call for when you need them
- People will do their work „through the network". The impact will be very great – both on the individual and on society
  - life will be happier
  - communication will be more enjoyable
  - unemployment would disappear from the of the earth forever

F.Ma. 20

Mark Weiser: The Computer for the 21st Century (1991)

- Computers vanish into the background
- No revolution in artificial intelligence is needed
- Social issues... perhaps the key among them is privacy
- Ubiquitous computers will help overcome the problem of information overload

F.Ma. 21

Agustin A. Araya: Questioning Ubiquitous Computing (1995)

- Technological problems whose solution would require the introduction of yet new technologies?
- Fundamental categories that govern our dealings with the world will be deeply altered
  - transformation of things into surveillable objects
  - substitution of the real world by digital surrogates
  - transformation of our surroundings into responsive artifacts
- Erases the differences between places, contributing to the uniformity of the environments
- Not driven by the purpose of satisfying human needs
  - primacy of technology over needs
- Ubicomp is an emerging form of technical absolutism

F.Ma. 22

Christopher Lueg: On the Gap Between Vision and Feasibility (2002)

- Why do some scenarios look like SF?
- Even supposedly simple scenarios easily cross the line between „regular" technical systems and systems that require human-like capabilities
  - the AI problem has not been solved
  - there is little hope that computational artifacts will finally become context aware in a non-trivial sense
- Not only technical, but also social and cognitive aspects are relevant
  - usability, privacy,...
- Removing annoyances (Mark Weiser!) not only involves developing smart technology but also requires a good understanding of the nature of these annoyances

F.Ma. 23

More Papers

- **Mark Weiser**: **Some Computer Science Issues in Ubiquitous Computing**. CACM, July 1993.
- **ISTAG: Scenarios for Ambient Intelligence in 2010**. 2001.
- **Marc Langheinrich, Vlad Coroama, Jürgen Bohn, Michael Rohs**: **As We May Live - Real-world Implications of Ubiquitous Computing**. 2002.

- **Robert Lucky**: **Connections**. IEEE Spectrum, March 1999.
- **Michael Schrage**: **Smart House**.
- **Stefan Betschon**: **Der Q-Faktor – Die Rhetorik des Fortschritts**. Neue Zürcher Zeitung, 7. Januar 2000.

F.Ma. 24

Book List (1)

- **Neil Gershenfeld**: **When Things Start to Think**. Henry Holt & Company, 1999 (German edition: Neil Gershenfeld: Wenn die Dinge denken lernen. Econ, 1999)
- **Peter J. Denning** (Editor): **The Invisible Future: The Seamless Integration of Technology into Everyday Life**. McGraw-Hill, 2001

- Denning, Metcalfe (Eds.): Beyond Calculation: The Next Fifty Years of Computing. ACM
- Daniel Amor: Internet Future Strategies. Prentice Hall, New York, 2001
- Daniel Amor: Das Handy gegen Zahnschmerzen und andere Geschäftsmodelle für die Dienstleister von morgen. Galileo Business, Bonn 2002
- Rudi Lamprecht: Zukunft mobile Kommunikation. Frankf. Allg. Zeitung-Verlag

F.Ma. 27

Book List (2)

- Frank Stajano: Security for Ubiquitous Computing. John Wiley and Sons, 2002
- Abowd, G.D. et al. (Eds.): Ubicomp 2001: Ubiquitous Computing, International Conference, Proceedings, 2001, Springer-Verlag
- Thomas, P., Gellersen, H.-W., (Eds.): Handheld and Ubiquitous Computing, Second International Symposium, HUC 2000, Proceedings, 2000, Springer-Verlag
- Gellersen, H.-W., (Ed.): Handheld and Ubiquitous Computing, First International Symposium, HUC'99, Proceedings, 1999, Springer-Verlag
- Donald A. Norman: The Invisible Computer. Cambridge, MA: MIT Press, 1998
- U. Hansmann, L. Merk, M. Nicklous, T. Stober: Pervasive Computing Handbook. Springer-Verlag, 2001
- Jochen Burkhardt, Horst Henn, Stefan Hepper, Klaus Rindtorff, Thomas Schaeck: Pervasive Computing. Addison Wesley, 2001