Seminal Ideas

CS260 Discussion
09/12/2011
Discussant: Ali Sinan Köksal
Three papers

Direct Manipulation Interfaces, Edwin L. Hutchins, James D. Hollan, Donald A. Norman, Human-Computer Interaction, 1(4), 1985

The Computer for the 21st Century, Mark Weiser, Scientific American, September 1991

Yesterday’s Tomorrows: Notes on Ubiquitous Computing’s Dominant Vision, Genevieve Bell, Paul Dourish, Personal and Ubiquitous Computing, 11(2), 2007
Direct Manipulation Interfaces

Edwin Hutchins
UCSD

James Hollan
UCSD

Donald Norman
Nielsen Norman Group

Aspects of “feeling of directness”

• *Distance* between user intent and physical requirements of system

• *Direct engagement* with semantic objects in the task domain
Gulfs of execution and evaluation
Two forms of distance
Semantic distance

• How easy is it to express user intent in interface language?
• Can things of interest be expressed concisely?
Articulatory distance

• What is the relationship between the meaning of an expression and its form?
• How can we leverage technology to design a non-arbitrary relationship?
Direct engagement

- Conversation metaphor: language is an intermediary
- Model-world metaphor: feeling of interacting with objects
A space of interfaces
Discussion

• Is this a useful model?
• What are the trade-offs?
• When are these interfaces not useful?
• What can be the disadvantages?
The Computer for the 21\textsuperscript{st} Century

Mark Weiser (1952-1999)

Photo from http://en.wikipedia.org/
Ubiquitous computing

• Vision of a future where:
  – Computing is integrated into everyday life
  – Computers fit in our environment by “disappearing”
Embodied virtuality

• Virtual reality simulates the world
• Embodied virtuality invisibly enhances it
Ubiquitous devices

- Two important factors: location and scale
- Three kinds of devices: tabs, pads and boards
Tabs

The Active Badge
This humble, yet high-tech version of the miniaturized badge is a combination of a small computer engine and a tiny infrared transmitter. The badge broadcasts its identity and so can trigger automatic doors, automatic telephone forwarding, and computer displays, customized to each person reading them. The active badge and other networked tiny computers are called tabs.
Pads
Interaction of devices
Technologic components

• Inexpensive hardware
• Software for ubiquitous applications
• Network that ties devices together
Discussion

• How influential was this work?
• Do we already have ubiquitous computing?
• What are the issues?
Yesterday’s Tomorrow: Notes on Ubiquitous Computing’s Dominant Vision

Genevieve Bell
Intel

Paul Dourish
UC Irvine

Framing points

• Ubicomp research focuses on the “proximate future” instead of dealing with its current form
• Ubicomp is already embedded within complex settings
• Ubicomp is inherently messy
“Proximate future”

• Today’s landscape is different from Weiser’s vision

• Still embracing this vision results in neglecting techno-social contexts

• Ubicomp will either never be here or is already here
Case study: Singapore

• Small country with robust economy
• Technologically literate, one of the most wired countries
• Strong government regulation of daily life
• Ubiquitous computing at wild, working
An “intelligent island”

• Bench-marked achievements and milestones
  – Online shrines during SARS outbreak
  – Heavy cell phone usage
  – Digitally enhanced vehicles, smart toll booths
Challenges

• Content, surveillance and control issues
• A censorship regime of collaborative nature
• Ubiquitous computing as a collective practice
Case study: Korea

• An example of infrastructural ubiquity: one of the most connected countries
• Unexpected patterns of technology usage:
  – Cyber parlors
  – Mobile devices used at home
• U-Korea: a technology future at a collective cultural level
Messiness

• In theory, messiness can be replaced by a clean infrastructure
• In practice, infrastructures are inherently messy
• Ubicomp research should take complexity of infrastructures into account
Towards a Ubicomp of the Present

• Ubicomp is already here:
  – It differs from Weiser’s initial vision
  – Its current uses need to be studied

• It is not evenly distributed:
  – A technology of today should operate on a heterogeneous infrastructure