

Designing Interactive Systems I

Lecture 6: Phases of Technology and Visions of HCI

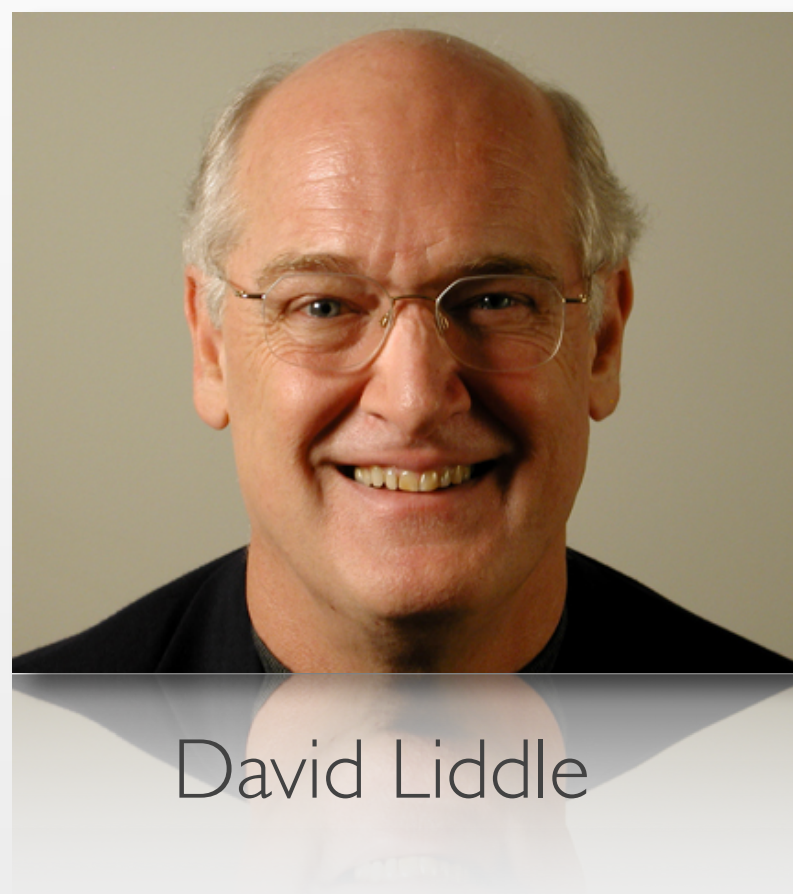
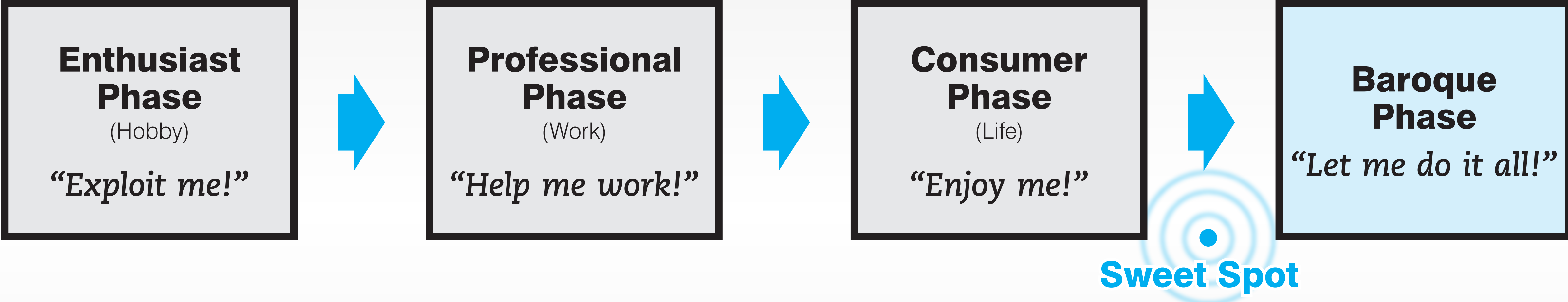
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<http://hci.rwth-aachen.de/dis>

Phases of Technology

Force Shifts During Phases of the Technology Lifecycle



Enthusiast Phase
(Hobby)
"Exploit me!"



Professional Phase
(Work)
"Help me work!"



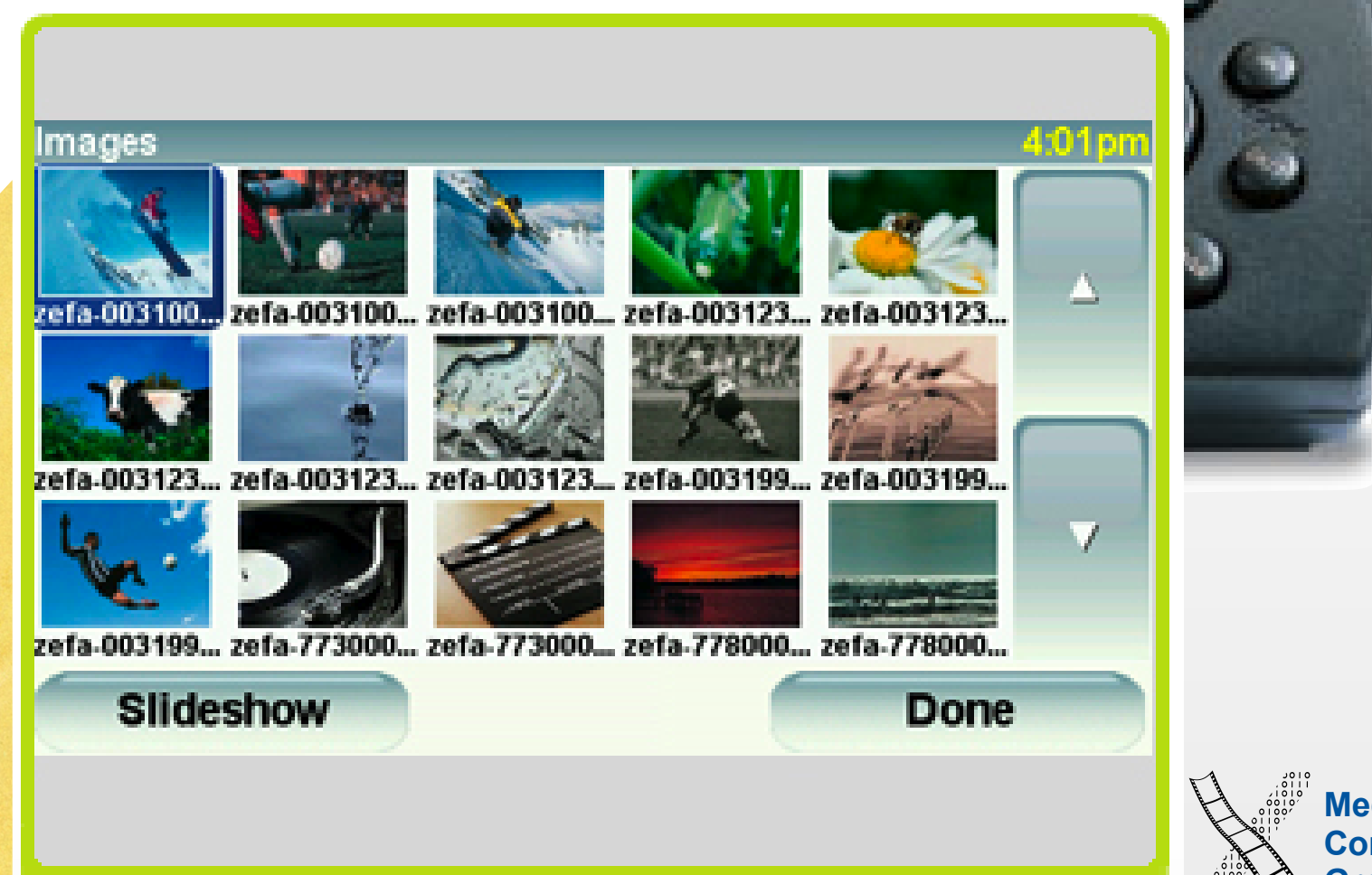
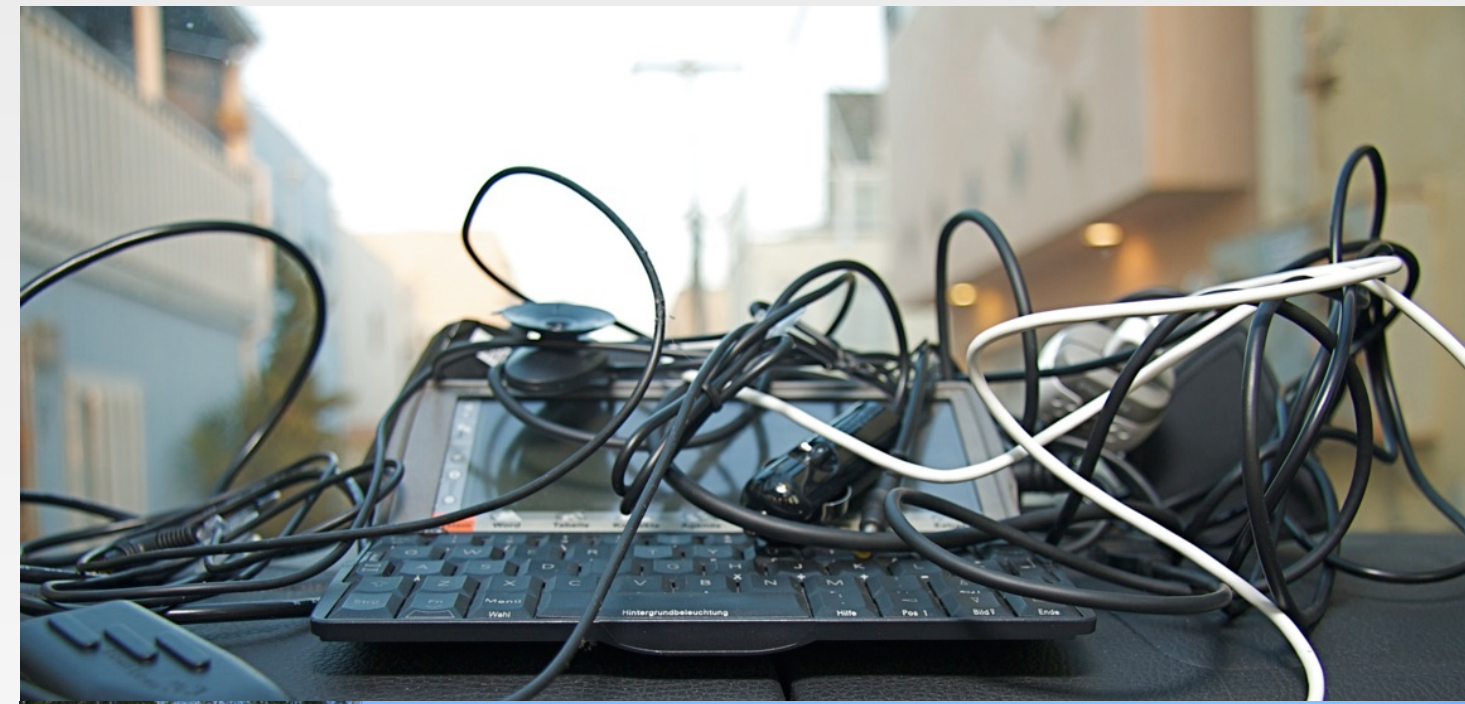
Consumer Phase
(Life)
"Enjoy me!"

Sweet Spot ●



Baroque Phase
"Let me do it all!"

Adapted from Bill Moggridge



Enthusiast Phase
(Hobby)
"Exploit me!"



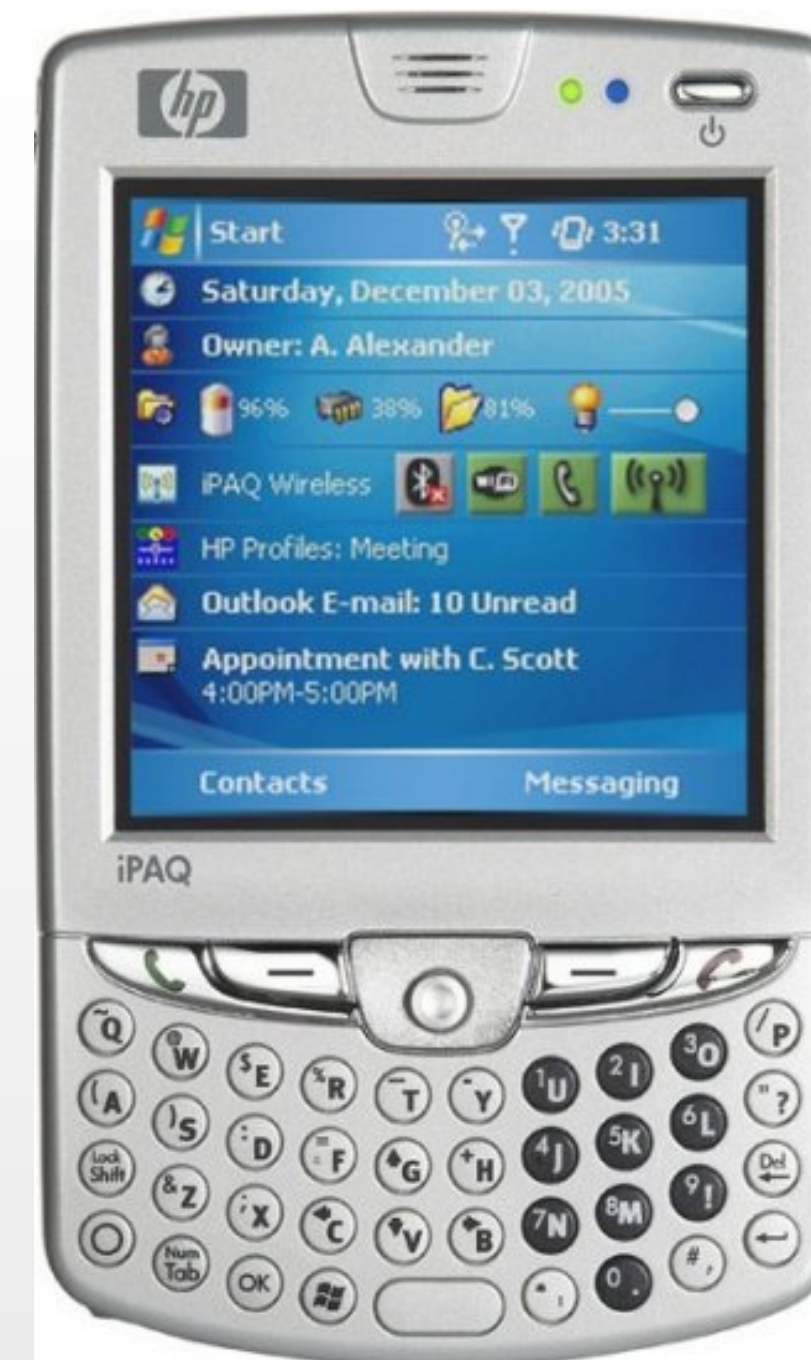
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16)

Sweet Spot

- Simplifies your life
- Rule-changing new functionality

Baroque Phase

- Complicates your life
- Feature creep

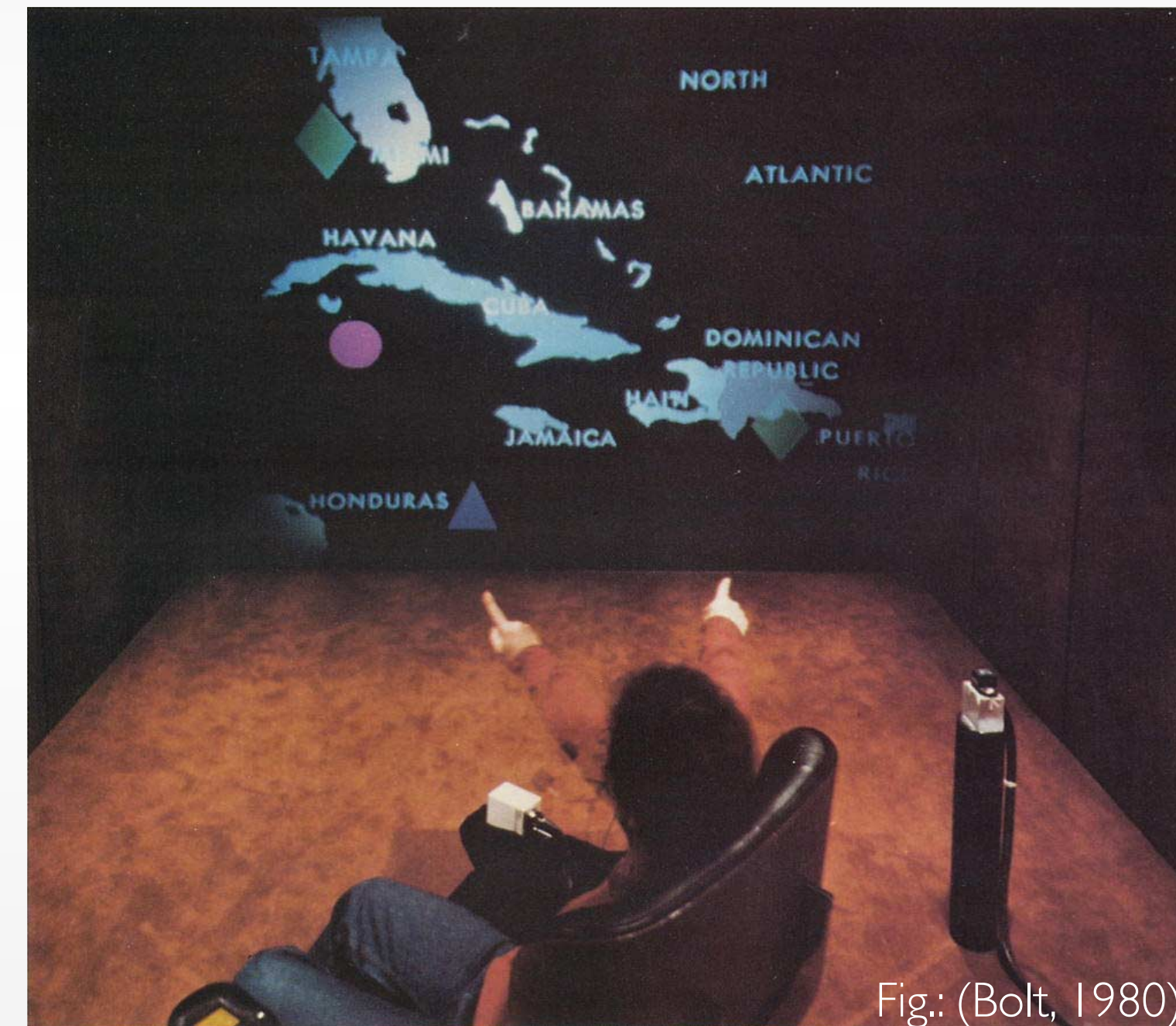
Visions of HCI

How to Interpret (Past) Visions of HCI

- From today's point of view:
 - What aspects have become standard?
 - What aspects haven't? Why?
- From the audience's point of view back then:
 - What was the vision likely provoking in the audience? Positive / Negative?
- From the author's point of view:
 - What are the key new ideas?
 - How was the vision prototyped and communicated?

Multimodal interfaces

- Put That There (MIT, 1980)
- Key advances:
 - Recognizing human gestures
 - Combining voice with other input modes





<https://www.youtube.com/watch?v=sC5Zg0fU2e8>

Multimodal interfaces

- Apple Knowledge Navigator (1988)
 - Vision video mockup (not implemented)
 - Key advances: Got people enticed with ideas of user agents and multimedia



Knowledge Navigator

<https://www.youtube.com/watch?v=hb4AzF6wEoc>

Sun Starfire (1992–1994)

- Video prototype of a future communication and computation system
- Bruce Tognazzini (TOG), Human Factors Engineering Group, SunSoft, Sun Microsystems
- Goal: Show a system that would be realistic in ten years
 - The story takes place on Nov 16, 2004...
 - Write down: What's realistic now, what isn't?



<https://www.youtube.com/watch?v=NKJNxgZyVo0>

Starfire: Video Prototyping Guidelines

- Continually question if assumptions are realistic within 10-year timeframe
- Iterate video prototype like any other prototype
- Include things that go wrong in the story
- Avoid impossible hardware designs
- Design interface first, then decide film scenes based on budget
 - E.g., Mouse, Voice, Reverse Angle much cheaper than Gesture, Pen

Starfire: Reading Assignment

- Bruce Tognazzini: The “Starfire” Video Prototype Project: A Case History. In Proceedings of CHI’94, ACM Press, pp. 99–105
- Paper documenting the video prototyping guidelines that evolved from the project
- Online in the ACM Digital Library, and at
<http://www.asktog.com/papers/videoPrototypePaper.html>
- For more information, see Tognazzini’s book “Tog on Software Design” (which he had planned to call “Starfire” at first)



Benddesk

Virtual Reality



- Key advance: Producing the illusion of being in a 3-dimensional world of computer-generated objects
 - Head-Mounted Display, Ivan Sutherland, University of Utah, 1967

Ubiquitous Computing

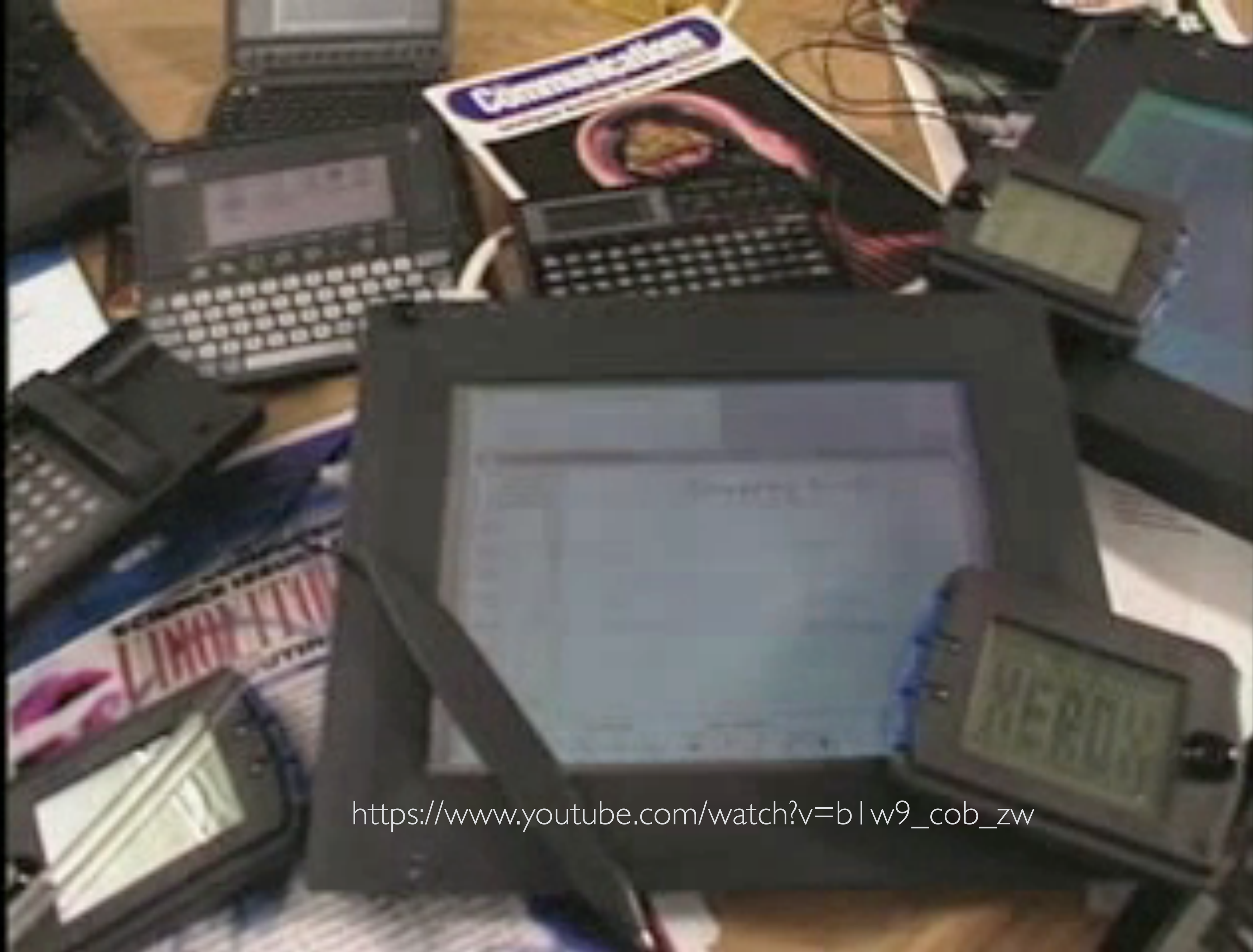
- Mark Weiser, Xerox PARC †
- 1991: The Computer For The 21st Century
 - Most profound technologies disappear in fabric of everyday life
- Example: writing
 - Early scribes had to know how to make ink, bake clay,...
 - Today, writing is on candy wrappers
 - A modern world without writing?
 - In comparison, information technology is still at the “scribe” stage
- Example: motors
 - 1900: 1 engine per factory
 - Now 22 motors in your car, hard and unnecessary to notice

Reading Assignment



Ubicomp Scenarios

- Neighborhood tracks (privacy vs. “coziness”)
- Paper(!) newspaper, but with electronic pen
- Finding lost garage door opener manual
- Foreview car mirror for traffic jams and parking spots and shops
- Fresh coffee indicator
- Collaboration via replicated/miniaturized tabs/pads, awareness, move content to board for active collaboration
- Switch effortlessly between machines, displays, and devices (meeting review example)



https://www.youtube.com/watch?v=bIw9_cob_zw

Ubicomp: PARC Devices

- Must know where they are (crucial to human perception)
 - Knowing room it's in can make computer adapt significantly, without any AI
- **Tabs/Pads/Boards**: inch/foot/yard scale, 100s/dozens/1 or 2 per room
 - A tab for each book spine

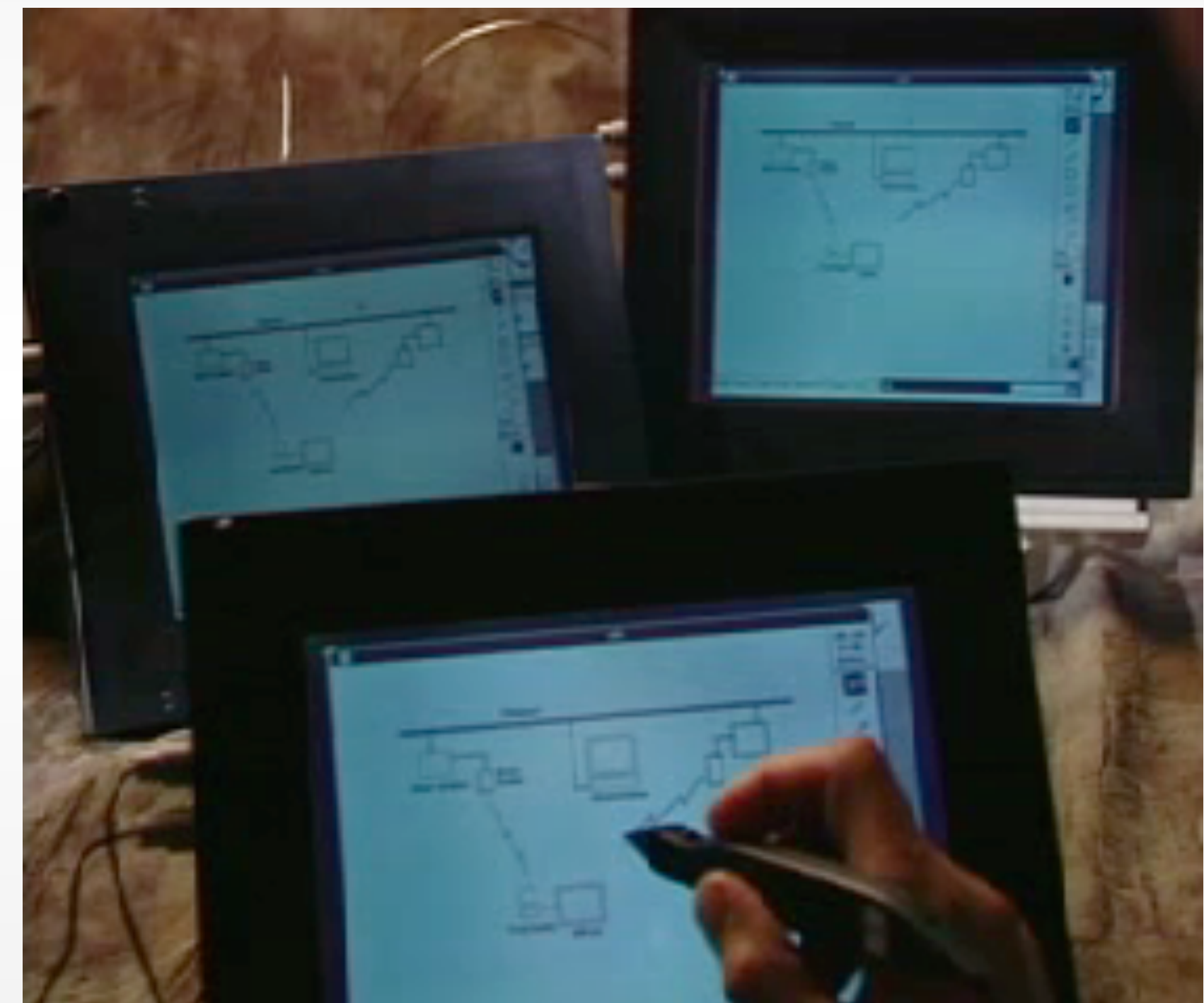
The PARC Tab

- 1993, ca. 50 deployed in PARC/EuroPARC
- Activated post-it note, can animate objects (find mislaid book,...), voting/consensus tool in meetings
- Use as active badge, identify wearer/object
- Use to shrink windows onto tab to carry with you
- Research product: assumed constant connectivity
- What is today's Tab? What's still missing?



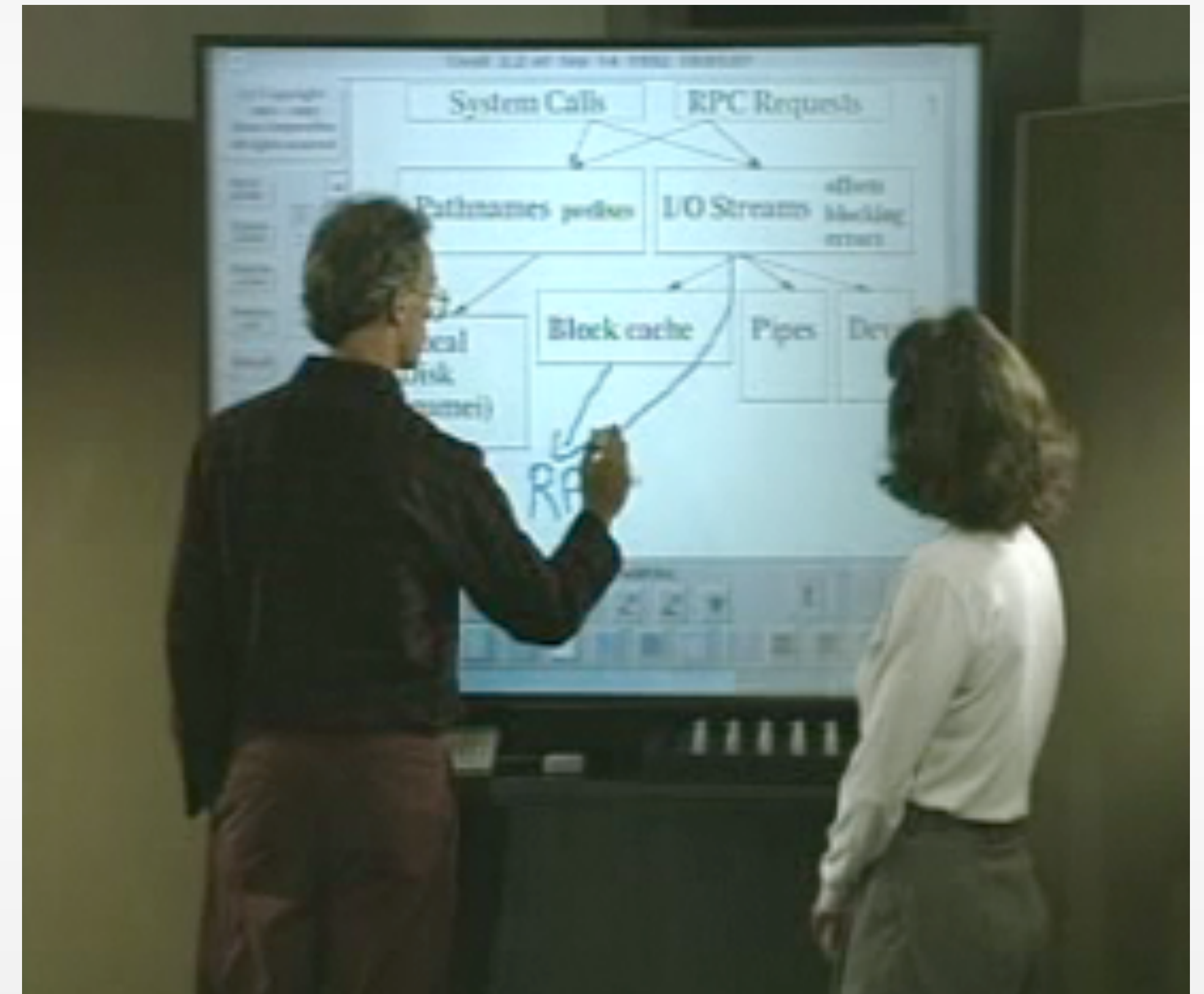
The PARC Pad

- Paper crossover with laptop
- Scrap computer (not personal to carry around with you)
- Antidote to windows: who wants 9x11" desk?
- Compare to modern Pads like the iPad: what's still missing?



The PARC Board

- Used as video screen
- Bulletin board (attuning to reader!)
- Whiteboard
- Flip chart
- Need different UI:
 - Keyboard awkward
 - Menubar hard to reach
 - Shared across Atlantic



Ubicomp vs. PC, VR

- Ubicomp = disappearing computer = augmented reality = calm computing
- Goal is to activate the world, putting computers into everything
- “PC” is just a transition towards real potential of computing, which will focus on human environment
 - Carrying a super-laptop is like owning just one very important book. Even customizing or having millions of it doesn't unleash literacy.
 - Multimedia as used today makes machines even more attention-grabbing, not disappearing
 - Psychological reasons for disappearing technology: Heidegger's hammer, compiling
- \neq VR: VR lets you explore unreachable worlds but tries to simulate infinite variety of reality instead of augmenting it.

Ubicomp Predictions

- Small displays, faster CPUs: correct
- Battery prediction too optimistic (days of use at 1000x800)
- Memory underestimated
- High-resolution walls (80+dpi, 10s of Mpix) not there yet
- OSs today assume fixed hardware configuration, but in UbiComp, devices come and go
- Window systems assume fixed base computer
- UbiComp diversity of input devices not being dealt with well
- Network: Bluetooth LE, problem of multiple connections

Ubicomp Today

- HUC'99 workshop
→ UbiComp Conference
- Commercial Tabs, Pads and Boards
 - Hardware, but often still clinging to the desktop metaphor, and not “plentiful”
- One of the most intriguing current visions for the future of HCI and CS
- “As calm as a walk in the woods”

