

Early Visions of HCI

Prof. James A. Landay
University of Washington
Autumn 2008

Hall of Fame or Shame?

<http://voodoo pc.com>

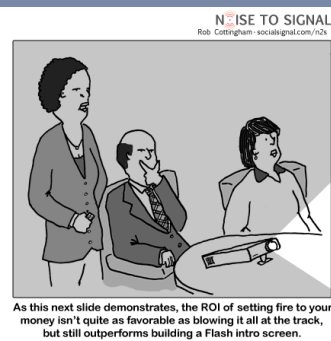
<http://www.vlboston.com/>

<http://www.tsmu.edu/>

Hall of Shame!

- Doesn't help user accomplish their task
 - why did they come to the site?
- Takes too long
 - most visitors will leave & never return
- May be valid for entertainment, art, or branding sites

Hall of Shame!



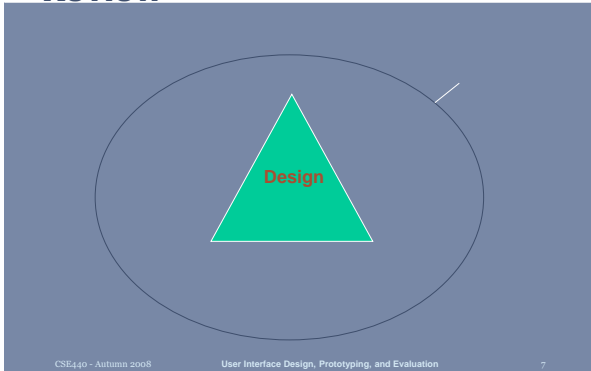
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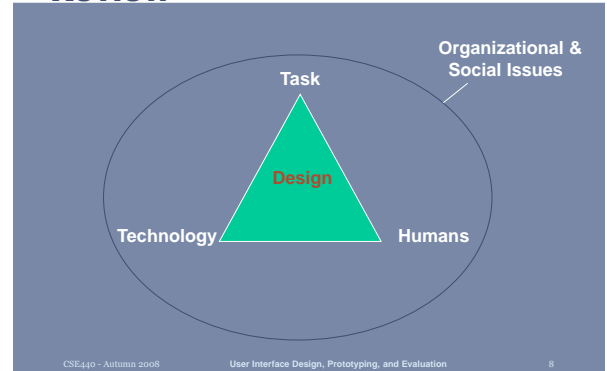
Outline

- Name Cards
- Review
- Computing in 1945
- Vannevar Bush & As We May Think
- Administrivia
- Computing in the 1960s
- Doug Engelbart & Augmenting Intellect
- Introductions

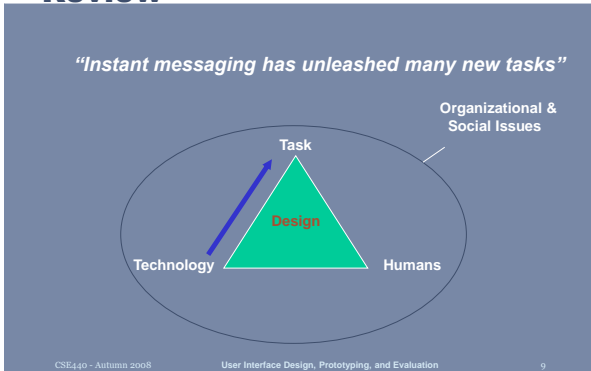
Review



Review



Review



Context - Computing in 1945

www.ibm.com

- Harvard Mark I
- 55 feet long, 8 feet high, 5 tons

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Context - Computing in 1945

Picture from <http://www.gmcc.ab.ca/~supy/>

- Ballistics calculations
- ← Physical switches (before microprocessor)
- Paper tape
- Simple arithmetic & fixed calculations (before programs)
- 3 sec. to multiply

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Context - Computing in 1945

11/01 Started Cosine Tapes (Sine wheel)
 1525 Started Multi-Address Test.
 1545 Relay to Panel F (math) in relay.
 168/514 First actual case of bug being found.
 1201 cloud down...

- First computer bug (Harvard Mark II)
- Adm. Grace Murray Hopper

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A Little About Vannevar Bush

- Name rhymes with “Beaver”
- Faculty member MIT
- Coordinated WWII effort with 6000 US scientists
- Social contract for science
 - federal government funds universities
 - universities do basic research
 - research helps economy & national defense



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As We May Think

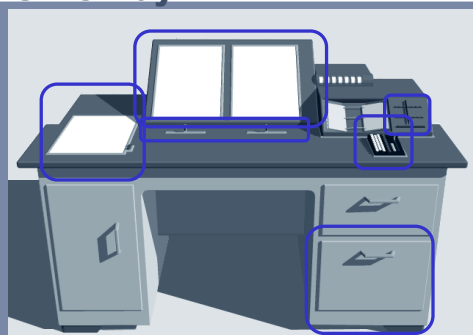
- Published in the *Atlantic Monthly* in 1945!
- Futuristic inventions / trends
 - wearable cameras for photographic records
 - Encyclopedia Britannica for a nickel
 - automatic transcripts of speech
 - Memex
 - trails of discovery
 - direct capture of nerve impulses
- Which was your favorite?
- Which do you want (or don't want)?

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As We May Think



Picture from <http://www.dynamicdiagrams.com/design/memex/model.html#download>
 Demo at http://www.dynamicdiagrams.com/cse_studies/mit_memex.html

As We May Think

- Very optimistic about future
 - technology could help society
 - technology could manage flood of info
- He was one of the most informed people of his time
 - look at trends, guess where we're going
 - What was he right about? Wrong about?

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As We May Think

- Have come true
 - increased specialization
 - flood of information
 - faster / cheaper / smaller / more reliable
- He missed or we are still waiting
 - microphotography?
 - digital technologies?
 - non-science / non-office apps?
 - memex?

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As We May Think

- Not so much predicting future as "inventing it"
 - hypertext
 - wearable memory aid
- Use technology to augment human intellectual abilities
- New kinds of technology lead to new kinds of human/machine & human/human interaction
- Be aware that engineering can impact society

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As We May Think

- Computers weren't always like this...



- Computers don't have to be like this!

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Administrivia

- Attendance
- Turn in assignment #1 now!
- Discussion section notes
 - Kate (TA)
 - away today until next Tuesday, Oct 7
 - available through email
 - Wednesday Section is Cancelled. Please go to Monday Section
 - Monday 4:30 - 6:20 pm in [EEB 031](#)
 - slides for yesterday are online under *discussion*

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Context - Computing in 1960s

- Transistor (1948)
- ARPA (1958)
- Timesharing (1950s)
- Terminals and keyboards



Vacuum Tube

- Computers still primarily for scientists and engineers

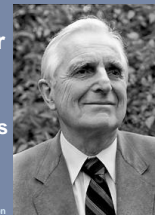
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About Douglas Engelbart

- Graduate of Berkeley (EE '55)
 - “bi-stable gaseous plasma digital devices”
- Stanford Research Institute (SRI)
 - Augmentation Research Center
- 1962 Paper “Conceptual Model for Augmenting Human Intellect”
 - complexity of problems increasing
 - need better ways of solving problems



Picture of Engelbart from bootstrap.org

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Augmenting Human Intellect



<http://sloan.stanford.edu/MouseSite/MouseSitePg1.html>

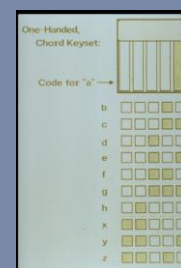
- 1968 Fall Joint Computer Conference (SF)
- Video of NLS (oNLine System)
- All this took place before
 - Unix and C (1970s)
 - ARPAnet (1969) & later Internet
- Won Turing Award in 1997 for this work

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Augmenting Human Intellect



- Advantages of chorded keyboards?
- Disadvantages?

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Augmenting Human Intellect



“At SRI in the 1960s we did some experimenting with a foot mouse. I found that it was workable, but my control wasn't very fine and my leg tended to cramp from the unusual posture and task.”

Augmenting Human Intellect



Video

Augmenting Human Intellect

- So what did we just see?
 - in terms of devices, interactions, & apps

Augmenting Human Intellect

- First mouse
- First hypertext
- First word processing
- First 2D editing & windows
- First document version control
- First groupware (shared screen teleconferencing)
- First context-sensitive help
- First distributed client-server
- Many, many more!

Augmentation not Automation

“I tell people: look, you can spend all you want on building smart agents and smart tools...

I'd bet that if you then give those to twenty people with no special training, and if you let me take twenty people and really condition and train them especially to learn how to harness the tools...

The people with the training will always outdo the people for whom the computers were supposed to do the work.”

Augmenting Human Intellect

- Example: Roman Numerals vs Arabic
- What is XCI + III?
- Now what is XCI x III?
- What is 91 * 3?
- New kinds of artifacts, languages, methodologies, and training can *enable* us to do things we couldn't before or *simplify* what we already do

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Tricycles & Bicycles: Specialized Tools



Tricycles Versus

Bicycles

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Where is Engelbart now?

- Bootstrap.org
 - Office in a Logitech building
- “[B]oosting any organization’s ability to successfully address problems that are complex and urgent”
- “[I]mproving society’s collective IQ”
- Bootstrapping society to improve how we improve

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Other Key Early Systems

- Sketchpad (by Ivan Sutherland)
 - Invented MANY modern interface/app ideas
- “Put, That, There!” (by Bolt & Schmandt)
 - Real multimodal UI – still don’t have this

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Summary

- Computers do not need to be the way we see them today
- Predict the future by inventing it
- Don’t only concentrate on novices

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Next Time

- Design Discovery: Contextual Inquiry
 - Chapter 3 of *Contextual Design*

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- **Introductions Outside**