Designing the Future:
*Early & Future Visions of HCI*

Prof. James A. Landay
Computer Science Department
Stanford University

Autumn 2023
November 6, 2023
Hall of Fame or Shame?

Virgin America Website
Courtesy Andrea S.
https://www.virginamerica.com/book

Book from San Francisco to

- BOSTON MA (BOS)
- LAS VEGAS NV (LAS)
- LOS ANGELES CA (LAX)
- NEW YORK/EWR NJ (EWR)
- NEW YORK/JFK NY (JFK)
- ALL CITIES
Virgin America Website
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Who’s flying?

- Adults: 1
- Children (Age 2-14): 1
- Lap Infants (Age 0-2): 0
- Pets: 0

Have special requests?

Continue with 2 guests
Hall of Fame or Shame?

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https://www.virginamerica.com/book
Hall of Fame!

Minimalist design w/ large & simple instructions

Whitespace shows what is important/related

Automatic location setting

Large calendar for easy/fast date selection (Why is it fast?)

Virgin America Website
Courtesy Andrea S.
https://www.virginamerica.com/book
Hall of Fame or Shame?

Shake Shack iPhone App

Don’t Wing It: Buffalo Chicken
This season’s total game changer.

Choose your pick-up type to get started
(Select one of our Shack Truck options below so we can get things sizin’)

Curbside Pick-Up
Park, tell us you’re here using the app, then we’ll bring your meal to your car.

Walk-Up Window
Walk over to our outdoor pick-up window, tell us you’re here using the app, then we’ll hand your meal to you.

Indoor Pick-Up
Head inside to our pick-up area, your meal will be waiting for you when you walk in.

Stanford Shopping Center
180 El Camino Real, Suite 8950, Palo Alto, CA 94304
Today 11:00am – 10:00pm
Next Available 11:15

Choose An Order Type

Pick-Up
Delivery

Burgers
Our custom 100% Angus beef blend, never frozen, no hormones or antibiotics ever, humanely raised and grazed in the USA.

ShackBurger
Cheeseburger with lettuce, tomato, ShackSauce (contains eggs, milk, soy, wheat, and gluten)
$6.39 500 cal.

Chicken Bites
Crispy, whole white meat bites served with honey mustard or BBQ (contains milk, wheat, soy, and gluten)

Crinkle Cut Fries
Crispy and cut from golden potatoes, prepared in cholesterol-free soy oil

Chicken Bites

Quantity

Honey Mustard
Sweet & Sour Honey
BBQ
Hall of Fame or Shame?

Shake Shack iPhone App

Choose your pickup type to get started. Select curbside, in-store, or delivery.

Choose an Order Type

- Curbside
- In-store
- Delivery

Don't Wing It! Buffalo Chicken

Mama's Famous Fried Chicken wings with spicy buffalo sauce. Under construction.

Walk-by Window

Order pickup from the walk-by window at your convenience. Available to customers from 11am-7pm.

Steelford Shopping Center

Order pickup from the Steelford Shopping Center in Steelford.

Don't Wing It! Buffalo Chicken

Choose a wing size:
- Small: 5 wings
- Large: 10 wings

Burgers

Our signature 1/2 lb beef burger, served with lettuce, tomato, and onion.

Chick-fil-A

Our signature 1/2 lb chicken sandwich, served with lettuce, tomato, and onion.

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Our signature 1/2 lb beef burger, served with lettuce, tomato, and onion.
Aesthetic images of their food

Whitespace shows what is important

Simple icons are easy to figure out

Only one key accent color (green)
  • for selection & key next step ("Add")
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Autumn 2023
November 6, 2023
Outline

• Wizard of Oz Technique
• Computing in 1945
• Vannevar Bush & “As We May Think”
• Doug Engelbart & Augmenting Intellect
• SketchPad, Dynabook & The Xerox Star
• 2023 CS147 Film Festival Awards
• Team Break
• Future Visions of HCI
Wizard of Oz Technique

- Faking the interaction. Comes from?
  - the film “The Wizard of OZ”
    - “the man behind the curtain”
- Long tradition in computer industry
  - e.g., prototype of a PC w/ a DEC VAX (minicomputer) behind the curtain
  - much more important for hard to implement features
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Computing in 1945

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

http://sites.harvard.edu/~chsi/markone/images/Mark1HousingSmall.jpg
Computing in 1945

ENIAC
First Electronic, General Purpose Computer

Sister Mary Kenneth Keller

Sister Mary Kenneth Keller, from Cleveland, Ohio, was one of the first women, and very likely the first woman, to receive a Ph.D. degree in computer science in the United States. Keller entered the Sisters of Charity, a Catholic religious order, in 1932 and professed her vows in 1940. Later, she studied at DePaul University, where she received a B.S. degree in mathematics and an M.S. degree in mathematics and physics. In 1965, she received a Ph.D. degree in computer science from the University of Wisconsin. Her dissertation work involved constructing algorithms that performed analytic differentiation on algebraic expressions, written in CDC FORTRAN 63 (9).

As a graduate student, Keller also studied at Dartmouth, Purdue, and the University of Michigan. At Dartmouth, the university broke the "men only" rule and allowed her to work in the computer center, where she participated in the development of BASIC.

After receiving her Ph.D. degree, Keller accepted an offer of a faculty position at Clarke College in Dubuque, Iowa. Keller founded the Computer Science Department there and chaired it for 20 years. She also established a master's degree program for computer applications in education. Keller felt that women should be involved in computer science and especially in the field of information specialist. In her words, "We're having an information explosion, among others, and it's certainly obvious that information is of no use unless it's available." Keller's vision extended beyond education and reached toward artificial intelligence. "For the first time, we can now mechanically simulate the cognitive process. We can make studies in artificial intelligence. Beyond that, this mechanism (the computer) can be used to assist humans in learning. As we are going to have more mature students in greater numbers as time goes on, this type of teaching will probably be increasingly important." Sister Mary Keller died at the age of 71 but has left a legacy of computers and education at Clarke College.

Sister Mary Kenneth Keller was one of the first women to receive a Ph.D. degree in computer science in the United States. (Courtesy Mount Carmel Archives)
Prof. Kathleen Booth
Inventor of Assembly Language (1955)

https://www.theregister.com/2022/10/29/kathleen_booth_obit/
Vannevar Bush Kicked Off Big Science

- MIT faculty member
- Coordinated WWII scientific effort
- Social contract for science
  - federal government funds universities
  - universities do basic research
  - helps economy & national defense

- “As We May Think”, the Atlantic Monthly, July 1945
- Futuristic inventions?
  - wearable cameras to record life
  - encyclopedia for a nickel
  - automatic transcripts of speech
  - trails of discovery
  - capture of nerve impulses
  - Memex
Memex

Picture from http://www.dynamicdiagrams.com/design/memex/model.htm#download
Microfiche
Was he right? Memex never built... or was it?

Memex #001 by Trevor Smith
2013
http://trevor.smith.name/memex/
Predicting → Inventing the Future
Computers weren’t always like this…

Computers don’t have to be like this!
Computing in 1965

IBM System/360

Computing in 1965

IBM System/360
360-91 panel. Licensed under Public Domain via Wikimedia Commons.
Melba Roy Mouton, an early programmer at NASA. (one of the “Hidden Figures”)

Melba Roy heads the group of NASA mathematicians, known as “computers,” who track the Echo satellites. Roy's computations help produce the orbital element timetables by which millions can view the satellite from Earth as it passes overhead. She went on to become Program Production Section Chief at Goddard Space Flight Center.
Douglas Engelbart (Turing Award 1997)

Augmenting Human Intellect

- Stanford Research Institute (SRI) in the 1960s
- 1962 Paper “Conceptual Model for Augmenting Human Intellect”
  - complexity of problems increasing → need new tools to solve
- Demoed NLS (oNLine System), 1968 Fall Joint Computer Conf. (SF)
- Known for?
  - mouse
Engelbart’s Crusade

“The complexity of a lot of the problems [in the world] and the means for solving them are just getting to be too much. The time available for solving a lot of the problems is getting shorter and shorter. So the urgency goes up… The complexity/urgency factor had transcended what humans can cope with. I suddenly flashed that if you could do something to improve human capability to cope with that, then you’d really contribute something basic.”

Augmenting Human Intellect

The NLS Hardware
CONTROL TECHNIQUES
CONTROL DEVICES
CONTROL DIALOGUE
CONTROL METALANGUAGE
INTRODUCTION

OVERALL ABOUT PROGRAM
NCS AS AN INSTRUMENT
CONTROL TECHNIQUES
NCS IMPLEMENTATION
USAGE
ACTIVITIES
CREDITS
Augmenting Human Intellect: Firsts!

- First mouse, and?
- First 2D editing & windows
- First hypertext
- First word processing
- First document version control
- First groupware (shared screen teleconferencing)
- First context-sensitive help
- First distributed client-server
- Many, many more!
NLS Was for Expert Use – Two Hands at Once!
Chorded Keyboard
Tricycles & Bicycles: Specialized Tools


http://www.flickr.com/photos/hotair2112/134303284/

Tricycles vs. Bicycles

“If ease of use was the only valid criterion, people would stick to tricycles and never try bicycles.” – Douglas Engelbart
May 24, 1962

Dr. Vannevar Bush
Professor Emeritus
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dr. Bush:

I wish permission from you to extract lengthy and definitely acknowledged quotes from your article, "As We May Think," that appeared in The Atlantic Monthly, July, 1945. These quotes would appear in a report that I am writing for the Air Force Office of Scientific Research, and I am sending a parallel request to The Atlantic Monthly.
More on Englebart

*Bootstrapping*, Thierry Bardini, 2000


*Tools for Thought*, Ch. 9 “The Loneliness of a Long-Distance Thinker”, Howard Rheingold, 2000

MouseSite (video clips/papers)

SketchPad – Sutherland (1963)
AR/VR – Sutherland (1965)
Dynabook – Kay (1974)
Xerox Star – 1st Commercial GUI (1981)

“The best way to predict the future is to invent it”

Alan Kay
2023au CS147 Film Festival Awards

- Best Acting
- Best Music/Soundtrack
- Funniest/Most Humorous
- Best Locations
- Best Production Values
- Most Coherent Values
- Best Project Concept
- Best Overall Video
The Nominees...

Playdate
Fitbud
Spur
QueerX
Arbor
Mersiv
RendezViewz
Sage
Keynotes
Turno

Autumn 2023

dt+UX: Design Thinking for User Experience Design, Prototyping & Evaluation
Best Acting

Winner
Spur

Runner Ups
Arbor
RendezViewz
Best Music / Soundtrack

Runner Ups
Turno & Mersiv
RendezViewz

Winner

Keynotes
Funniest/Most Humorous Video

Runner Ups
- Mersiv
- RendezViewz

Winner
FitBud
Best Locations

Runner Up

Arbor

Winner

Sage
Best Production Values

Runner Ups

Playdate & Turno

Winner

Arbor
Most Coherent Values

Runner Ups

Turno, Arbor, RendezViews

Sage

Winner

QueerX
Best Project Concept

Runner Ups
Mersiv
RendezViewz

Winner
Turno
Best Overall Video

Runner Ups
Mersiv & Spur

Winners
Arbor & FitBud
People’s All-Around

Winner

RendezView
Administrivia

• Keep up w/ readings/HW on class website
  – http://hci.stanford.edu/cs147
  – midterm coming up Wed next week

• Questions?
Midterm

**Scope:** Everything through Usability Testing (Week 7 - Lecture 14) including Reading/Videos/Podcasts, Lectures, Assignments.

**Format:** Will primarily be a multi-part design problem (but know and be able to demonstrate all aspects of the design process & use facts for reasoning for your answers), with some multiple choice/short answer as well.

**Place:** Hybrid exam – part I in class & part II (design problem) at home (Gradescope)

**Time:** This midterm will take place during a 24-hour window starting Wednesday, Nov. 15, at 1:30 pm Pacific time. You will have ~1:30 for part I in class and ~2 hour for part II at home.
TEAM BREAK
“The best way to predict the future is to invent it”

*Alan Kay*
The Future
Microsoft Productivity Future Vision 2019

DID YOU KNOW

In India cats are considered bad luck?
Spike Jonze’s Her (2013)
Next Time

• Lecture
  - Usability Testing

• Optional videos/readings
  - Meet the Normals: Adventures in Universal Design (6:42)
  - “Disability Studies as a Source of Critical Inquiry for the Field of Assistive Technology”, Mankoff et al., ASSETS 2010

• Studio
  - Group Heuristic Evaluation (need to participate to get a grade)