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

Prof. James A. Landay  
Computer Science Department  
Stanford University

Winter 2022

February 7, 2022
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
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?

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

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Hall of Fame or Shame?

Virgin America Website
Courtesy Andrea S.
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 An Order Type
- Pick-Up
- Delivery

Choose your pick-up type to get started
Select one of our Shack Track options below so we can get things sizzling!

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 Centro Real, Suite #930, Palo Alto, CA 94304
Today 11:00am – 10:00pm
Next Available 11:15

Burgers
Our custom 100% Angus beef blend, never frozen, no hormones or antibiotics ever, humanely raised and grassed 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)
$5.09 300 cal.

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

Rate your recent order:
2:21 pm – 2:26 pm from Stanford Shopping Center

Winter 2022
Hall of Fame or Shame?

Shake Shack iPhone App

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

Quantity
- 1 +

Honey Mustard

Sweet & Sour Honey

BBQ

Shack Sauce
Added 60 cal.

$7.69 570 cal. Add to Bag

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

Sweet, you’re almost done!
These items pair well with your order.

Chicken Bites
10 pcs, Shack Sauce

$7.69

Fries
$3.35 470 cal. Add $4.29 220 cal.

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

$7.69 1 item Check Out

Pick-up from Stanford Shopping Center
Pick-up in: 5–10 mins

Pick-up from Stanford Shopping Center
Pick-up in: 7–12 mins

Select Payment Method
- Apple Pay
- Pay with a credit card

Pay $8.39
Hall of Fame or Shame?

Shake Shack iPhone App

Winter 2022
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”)
Designing the Future:  
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Winter 2022  
February 7, 2022
Outline

• Wizard of Oz Technique
• Computing in 1945
• Vannevar Bush & “As We May Think”
• Doug Engelbart & Augmenting Intellect
• SketchPad, Dynabook & The Xerox Star
• 2022 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
Wizard of Oz Technique

- much more important for hard to implement features
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)
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 / trends?
  - 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#downloa
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!
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

NLS was for expert use – two hands at once!
Augmenting Human Intellect

The NLS Software

Usage:

Application Examples:
Two-Person Collaboration:
Information Retrieval
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!
Chorded Keyboard
Tricycles & Bicycles: Specialized Tools

Tricycles vs. Bicycles

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

http://www.flickr.com/photos/hotair2112/134303284/
Engelbart’s Influences

Douglas C. Engelbart  
Stanford Research Institute  
Menlo Park, California

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)

http://web.stanford.edu/dept/SUL/library(extra4/sloan/MouseSite/Archive.html
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
Two Minute Break
2022 CS147 Film Festival Awards

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

Runner Ups
Chefherd (now Recipal)
FlowShow

Winner
CoCo
Best Music / Soundtrack

Runner Ups
Chefherd (now Recipal)
YoursTruly

Winner
AuraScope
Funniest/Most Humorous Video

Winner

Chefherd

(now Recipal)
Best Locations

Runner Ups
AuraScope
DoHo

Winner
CoCo
Best Adaptation to COVID Restrictions

Winner

Quokka Tips

Runner Ups

YoursTruly

Match.me
Best Production Values

Runner Ups
ALTiO
CoCO

Winner
AuraScope
Most Coherent Values

Runner Ups
CoCo
ALTiO

Winner
FlowShow
Best Project Concept

Runner Ups
FlowShow
ALTIo

Winner
Grove
Best Overall Video

Runner Ups

Chefherd (now Recipal)
Grove

Winner

CoCo
Grading on Assignment #4

Concept Video Assignment #4

A4 Slides:  
- 2% ✓ --: 2% ✓ -: 31% ✓ : 38% ✓ +: 27% ✓ ++: 0%

A4 Concept Video:  
- 0% ✓ --: 0% ✓ -: 18% ✓ : 44% ✓ +: 31% ✓ ++: 7%

Average (total): 91%
Assignment Grading Buckets

- **Far exceeds expectations**: Reserved for ~ the top 3 submissions that can be used as examples in class. This is an A+, often a perfect or > 97% score.

- **Fulfills the expectations in the spec**: Students engaged with the design process, though maybe some small issues remain. Presentation understandable. This is a B+/A- range grade (88 - 92%).

- **Fulfills the expectations in the spec and some elements exceed expectations**: Strong engagement with the design process. Excellent presentation of the work. This is an A range grade (93 - 97%).

- **Relatively complete, but there are components of unsatisfactory quality**: Presentation may fall short (e.g., poor image resolution, too much text). This is a B range grade (83 - 87%).

- **Incomplete or multiple parts are of unsatisfactory quality**: Shows sub-par engagement with the design process. Presentation likely falls short in many ways. This is a C+/B- range grade (78 - 82%).

- **Missing substantial assignment components and/or mostly poor quality**: Does not represent engagement with the design process. This is a C range grade or lower (< 78%).
Administrivia

- Questions about Medium-fi Prototype assignment?
  - both the Figma Basics & Design Systems workshops are now online. Check them out for this & last assignment!

- Fill out Midway Team Check-in TODAY!

- Keep up w/ readings/HW on class website
  - http://hci.stanford.edu/cs147
  - midterm coming up in week 8 (weeks 7-8 have lighter work)
Midterm

**Scope:** Everything through Conceptual Models and Interface Metaphors (Week 7 - Lecture 13) including Reading/Videos/Podcasts, Lectures, Assignments.

**Format:** Will primarily be a multi-part design problem (less memorization of facts, but know and be able to demonstrate *all* aspects of the design process & use facts for reasoning for your answers)

**Place:** Take-home exam (Gradescope)

**Time:** This midterm will take place during a 48-hour window starting Wednesday, Feb. 23, at 11am Pacific time. You will have a timed ~3-hour limitation to complete it.
Code.X: Teach Design Thinking and CS

Spend 3-6 weeks teaching Palestinians or Albanians this summer with Code.X, inspiring high schoolers and immersing yourself in local culture.

- **In person teaching with paid expenses (flight and accommodation)**
- **Code for Palestine:** June 17 - July 3 and July 15 - July 31
- **Code for Albania:** July 8 - July 24 (in Tirana, Albania)

- **Deadline:** Thursday, Feb 24th
- **Application:** [https://tinyurl.com/codex-2022](https://tinyurl.com/codex-2022)
- **Contact:** Romeo Umana at romeo@codedotx.org or Abdallah AbuHashem abdallah@codedotx.org
Bauhaus Typography at 100

A Letterform Archive Exhibition
November 13, 2021 – April 27, 2022
TEAM BREAK
EXIT TICKET

“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
  - Human Abilities

- Read
  - Listen: Wait Wait... Tell Me!, 99% Invisible, Episode 369 (36 min.)

- Studio
  - Midterm review