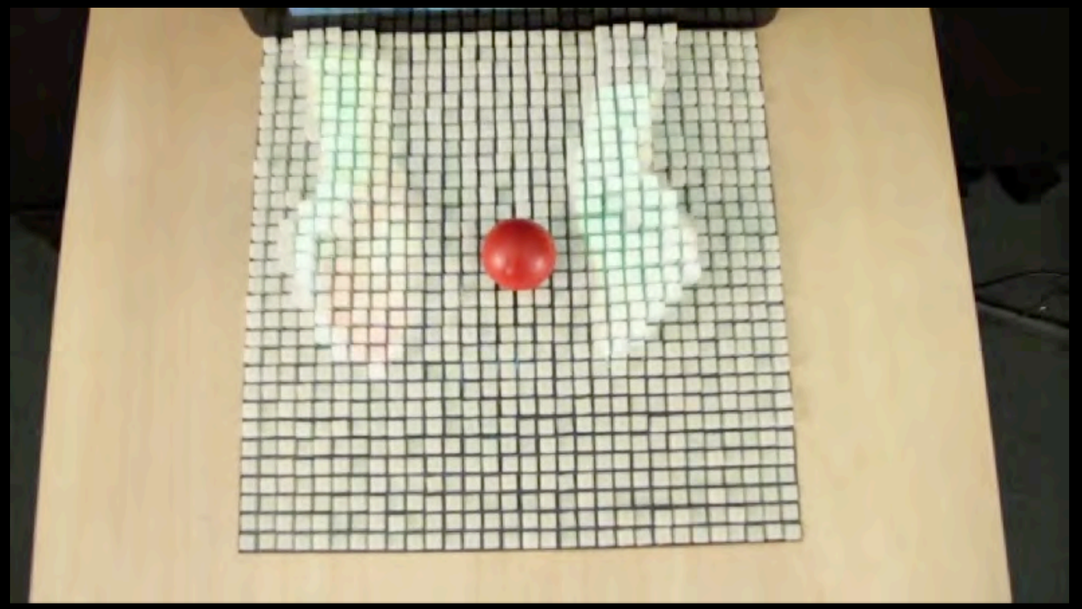
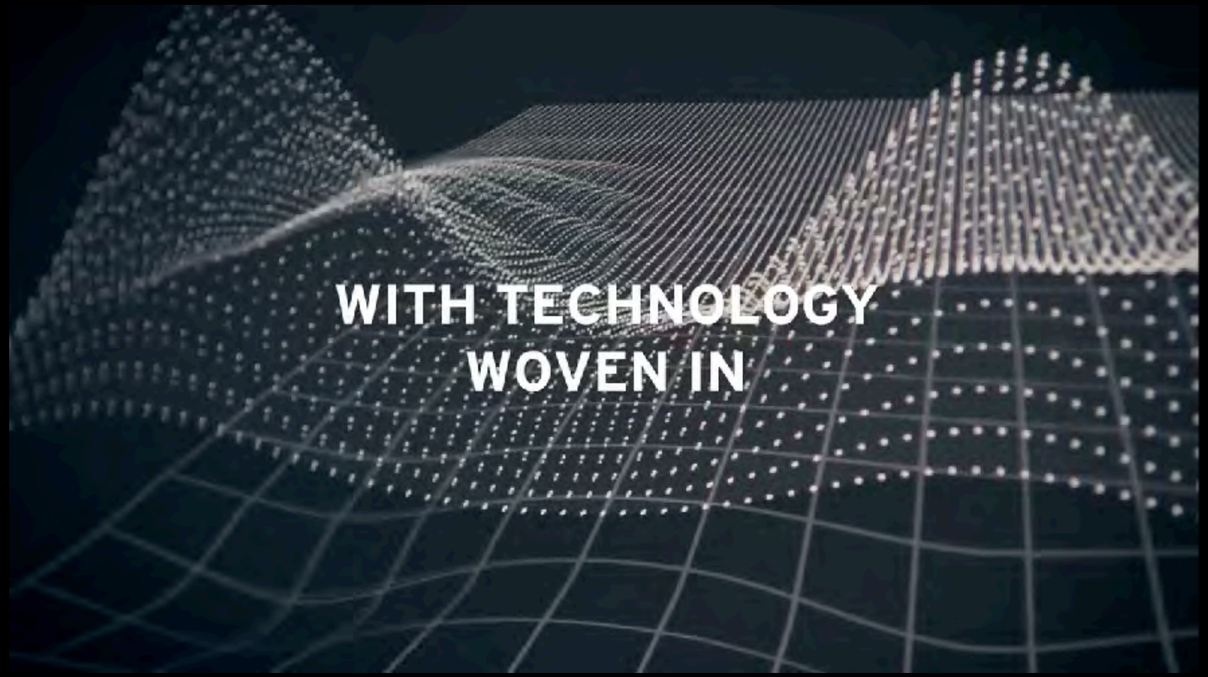
CS 160 User Interface Design





FALL **2018**

CS160

USER INTERFACE DESIGN

FALL 2018

INTRODUCTION

22 AUG 2018

ERIC PAULOS
www.paulos.net

UNIVERSITY OF CALIFORNIA Berkeley

TOPICS FOR TODAY

Introductions

Enrollment

Course Overview

Project Description

Course Mechanics

Assignments

ERIC PAULOS


apple IIe


SHIFT
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C

Cal UNIVERSITY OF CALIFORNIA BERKELEY

PAULOS ERIC J
10145772

NON TRANSFERABLE - REPLACEMENT CHARGE

ERIC PAULOS

PROFESSOR

EMILY PEDERSEN

Head GSI

MICHELLE CHEN

GSI

ADRIANA BABAKANIAN

GSI

JESSIE LYU

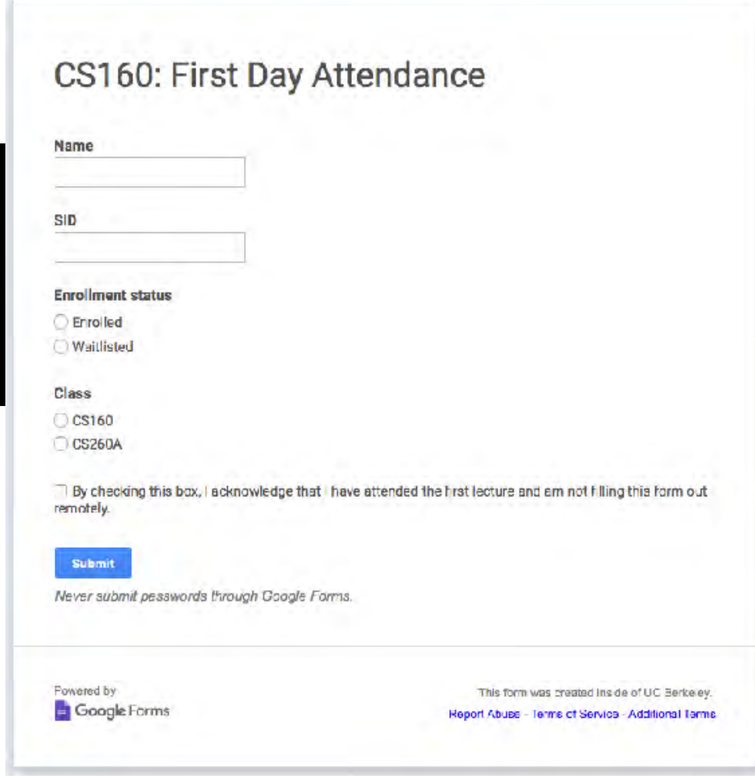
GSI

VINAY SATISH

GSI

DAVID OLIVAR

Reader



CS160 FALL 2018

http://tiny.cc/cs160

CS160

USER INTERFACE DESIGN

FALL 2018

INTRODUCTION

22 AUG 2018

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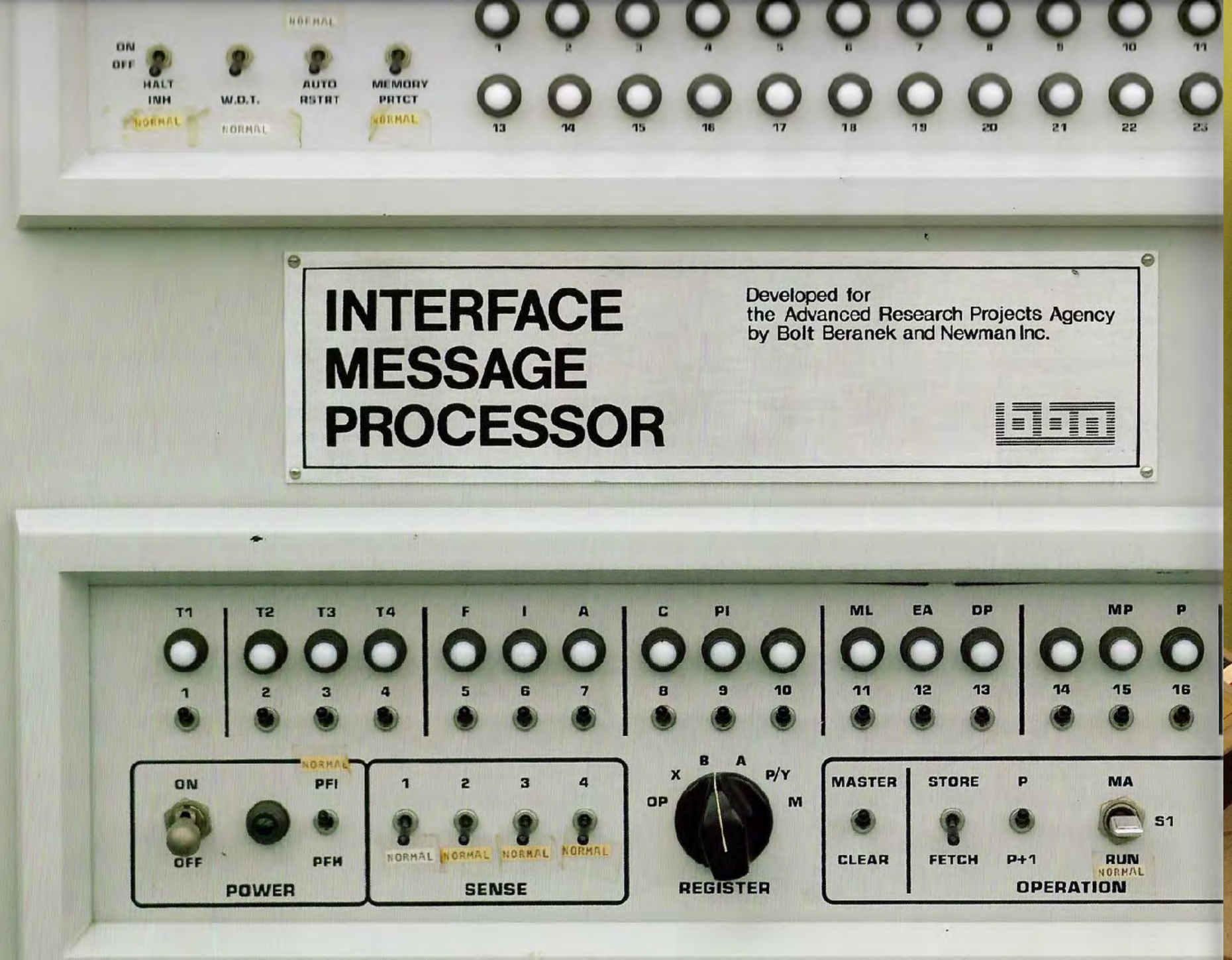
ON
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the Advanced Research Projects Agency
by Bolt Beranek and Newman Inc.
T1
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ON
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POWER
SENSE
REGISTER
MASTER
CLEAR
STORE
FETCH
P
P+1
MA
S1
RUN
OPERATION

http://hci.berkeley.edu/cs160

Home Showcase Requirements Grading Syllabus bCourses Piazza

Course Description

CS160 is an introduction to Human Computer Interaction (HCI). You will learn to prototype, evaluate, and design a user interface. You will be expected to work within a group of four or five students in this project-based course. Your project topic will be proposed by your group and your project design and implementation will follow a human-centered process. The final result will be an interactive prototype of a novel user experience carefully tailored to the needs of your intended users.

In contrast to most of the other CS classes at Berkeley, CS160 does not primarily focus on particular algorithmic techniques or computer technologies. Instead, the focus of the course is on developing a broad set of skills needed for user-centered design. These skills include ideation, needs assessment, communication, rapid prototyping, algorithmic implementation and evaluation.

FAQ:

I can't enroll but I see space in the class?

I do not control enrollment. It is handled through CS and does give preference to EECS and

CS160

Lectures:	Mon+Wed 10:30AM – 12:00PM in 310 Jacobs Hall
Instructor:	Professor Eric Paulos
Contacting GSIs:	via bCourses
Midterm Exam:	Monday 15 October 10:30AM–12:00PM
Public Showcase:	Wed 5 Dec during RRR week in 310 Jacobs (see syllabus)
Final Presentations:	Tue 4 Dec during RRR week in 310 Jacobs (see syllabus)
Final Materials	Due Friday 7 Dec at 11:59PM

Course Staff

	Office Hour	Section
Emily Pedersen	TBD	TBD/TBD

I CAN'T ENROLL BUT I SEE SPACE IN THE CLASS?

I do not control enrollment. It is handled through CS and does give preference to EECS and L&S CS students. We hope to accommodate as many as we can. Please put yourself on the waitlist. We cannot enroll you if you are not on the waitlist. Ignore messages through enrollment that say there are open spaces in the class – these are enrollment artifacts. We are aware of the current and expected enrollment and handling them to accommodate as many students as we can. **Final enrollment will be decided by Monday 27th August.**

HOW DO I GET ON THE WAITLIST? IT'S NOT WORKING FOR ME

I do not control the waitlist. I have communicated with staff that anyone would be able to be added to the waitlist. I have been told that there are sometimes glitches in the system. If you cannot add yourself to the waitlist, do not email me. I cannot add you it or provided any help on how to do so. I have been told the following – “If you get contacted by any other students who cannot even waitlist, please have them **contact sishelp@berkeley.edu**."

I HAVE A FINALS CONFLICT WITH CS160 AND ANOTHER CLASS?

No worries, CS160 does not have final. We do have a final critique and public showcase during RRR week that you must attend (exact date can be found on the syllabus).

WILL THE CLASS BE WEBCAST?

Yes, it is scheduled to be webcast. But you are of course strongly encouraged to come to class. Also, **there will be a set of required attendance days** which can be found on the syllabus. Attendance will count towards your participation grade.

I HAVE ANOTHER CLASS AT THE SAME TIME?

Please enroll in only one class at the same time. There will be several required lectures throughout the semester. Please don't make myself and the teaching staff work around your complex schedule. We are excited to teach CS160 and will be there and present for every class to share this learning experience with you.

I HAVE A GREAT PROJECT IDEA I WANT TO WORK ON, CAN I DEVELOP IT THROUGHOUT THE COURSE?

We will all work from a single design brief for the final project. The brief will provide enough creative range for everyone but you will need to keep your final design within the final scope of work. Best to jump into the class ready to generate new ideas than to bring one you have already developed or have thought about.

WHEN ARE THE SECTIONS AND HOW DO I ENROLL?

Sections are on Fridays. Most are not required but again you are strongly encouraged to attend as they provided much needed technical materials to complete the assignments and build your HCI skills. You are free to attend any of the sections listed. We will be collapsing some of the sections after the first week when we sort out attendance and actual section time demand. For now, be prepared to select a section by the first class.

IS THERE A MIDTERM?

Yes, it's Monday October 15th during class time. It cannot be rescheduled (please do not ask) so please confirm you can attend that class.

CAN I FORM MY OWN TEAM?

Please realize that I know there are many functional groups and friendships within our UC Berkeley community. I have tried nearly every mechanism for forming groups and by far the best is for the teaching staff to select the groups. Groups will be formed and finalized by the teaching staff and professor.

WHAT HAPPENS IN THIS CLASS?

For many of you, this will be one of the first times we focus on the user experience within computer science. You will blend your technical and computational lens with a humanist view of people, motivations, needs, desires, emotions, and demographics. You will strengthen your design skills and develop inspiring portfolios of work. If you put in the time and effort, this class will change you ... and you'll likely have some fun along the way.

GREAT, THE CLASS IS WEBCAST.
I'M DEFINITELY NOT GOING TO CLASS.

I know most of you are not thinking that but indeed I'm not naïve enough to not realize that by webcasting lectures that some of you interpret that as an open invitation to not attend. Your experience at Berkeley is precious. It is such an amazing moment in your life. I know you may not realize that now but trust me it is (ask your friends that have graduated and our out a few years)! For you to simply opt-out of many of the important experiences is not only disheartening (for me and you) but also robs of you of the essential, once in a lifetime experience of being a student. Don't take my word for it? Here are public, unsolicited comments about my offering of CS160.

“It is the single most amazing class I’ve taken at Berkeley”

“I owe my current career plans to CS160; this was the class that got me very interested in the area of mobile development.”

“Overall I highly recommend taking CS160 if you’re remotely interested in UI/UX, design, being a program manager, starting your own company, or just a software engineer who wants to build a better user experience. The skills in understanding users, and sketching out ideas have helped me in my career.”

“The lectures themselves were very nonintuitive and interesting. You kinda have to attend lectures in order to keep up with the class. A couple of my friends tried to study for the midterm the night before by just reading the slides (they had never attended a single lecture). Bad mistake…they only performed a std. deviation above average. They could’ve topped the class had they just gone to lecture.”

So attend class, be engaged, change your perspective, and be rewarded. I'm here to help you along that path. Please be there with me!

IMPORTANT!!!

Roughly first half of semester will be lectures (some required attendance)

There will be a midterm on 15 March in class

Second half of semester will be studio classes

Mandatory attendance in Studio (more on this later)

There will be a final critique during RRR week — see syllabus

There is no final

YOU MUST SIGN IN TODAY

BY END OF CLASS (12:00 PM)

IF YOU DON'T WE'LL DROP YOU

http://tiny.cc/cs160

IF THIS IS NOT THE CLASS FOR YOU…

PLEASE DROP IMMEDIATELY!

…GIVE OTHERS A FAIR CHANCE TO GET IN

THIS COURSE

Is about reliably building well designed **interactive systems**

The goal is not to build a working system but an **interactive prototype**

We place emphasis on **fieldwork**, rapid **prototyping** and user **testing** to find the right design and avoid obvious and not-so-obvious mistakes

CLASS CULTURE EXPECTATIONS

UC Berkeley Honor Code
https://teaching.berkeley.edu/berkeley-honor-code

Campus Principles of Community
https://diversity.berkeley.edu/principles-community

University Standards for Academic Integrity
https://sa.berkeley.edu/conduct/students/standards

CLASS CULTURE

"As a member of the UC Berkeley community, I act with honesty, integrity, and respect for others."

INCLUSIVE CLASSROOM

If you make a mistake, correct yourself

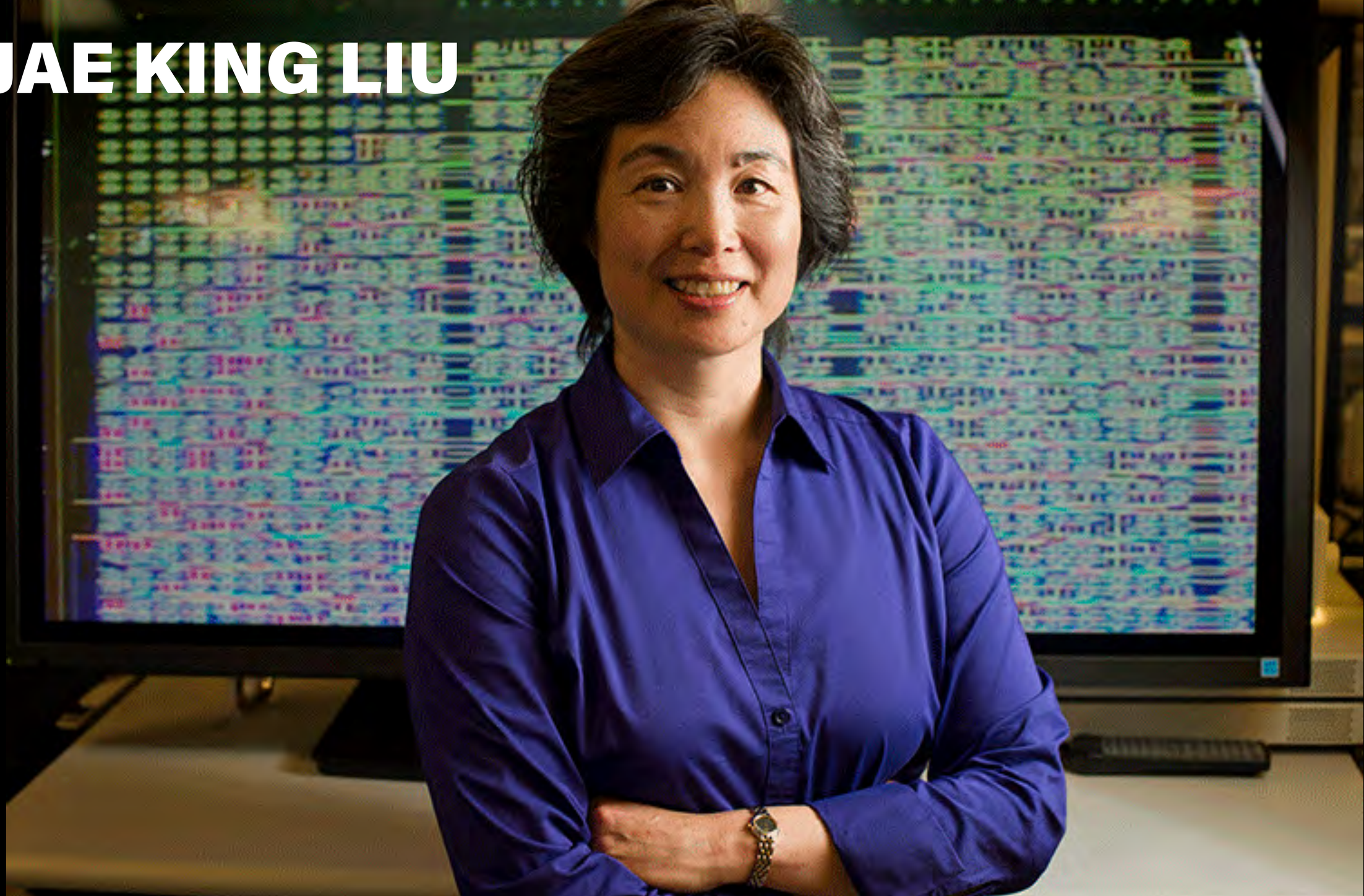
If someone else makes a mistake, correct them

If I make a mistake please correct me

Going on as if it did not happen is actually less respectful than making the correction

INCLUSIVE CLASSROOM?

TSU-JAE KING LIU



OSCAR DUBÓN

CLASS PROJECT OVERVIEW

THIS COURSE

This semester we focus on **mobile** applications

Android Studio

ASSIGNMENT TYPES

PROG: Programing assignments to help you get up to speed on working with Android

DESIGN: Design assignments to allow you to explore the HCI material in practice unrelated to a specific hardware platform

FEED: Feedback about groups and teamwork

PROJECT: The main team based assignment

TEAMS

- Groups will form in Week 5
- 5–6 students to a team
- You'll work with students with different skills/interests
- Apply several HCI methods to a single interface
- Do not wait to drop!

REQUIREMENTS

- CS160 is an upper division course
- You will work extensively on one significant programming project
- To participate fully in this course, you are required to have taken CS61B or equivalent
- We assume that you are familiar with Java & are comfortable coding a large-scale project
- You must be able to attend one of the sections
- You must commit to working with your assigned team on your group project
- You not are required to own an Android phone. However....
- At least one member in each group (set in week 4) will need to own an Android phone that can be used for development, deployment, documentation, and evaluation of your team's work
- Check withe the GSIs and on Piazza if you are unsure

ANDROID PHONE SHOPPING

Phones should be running recent Android version 8+ (Android “Oreo”)

No Tablets, must be an Android phone

Check Piazza for more info

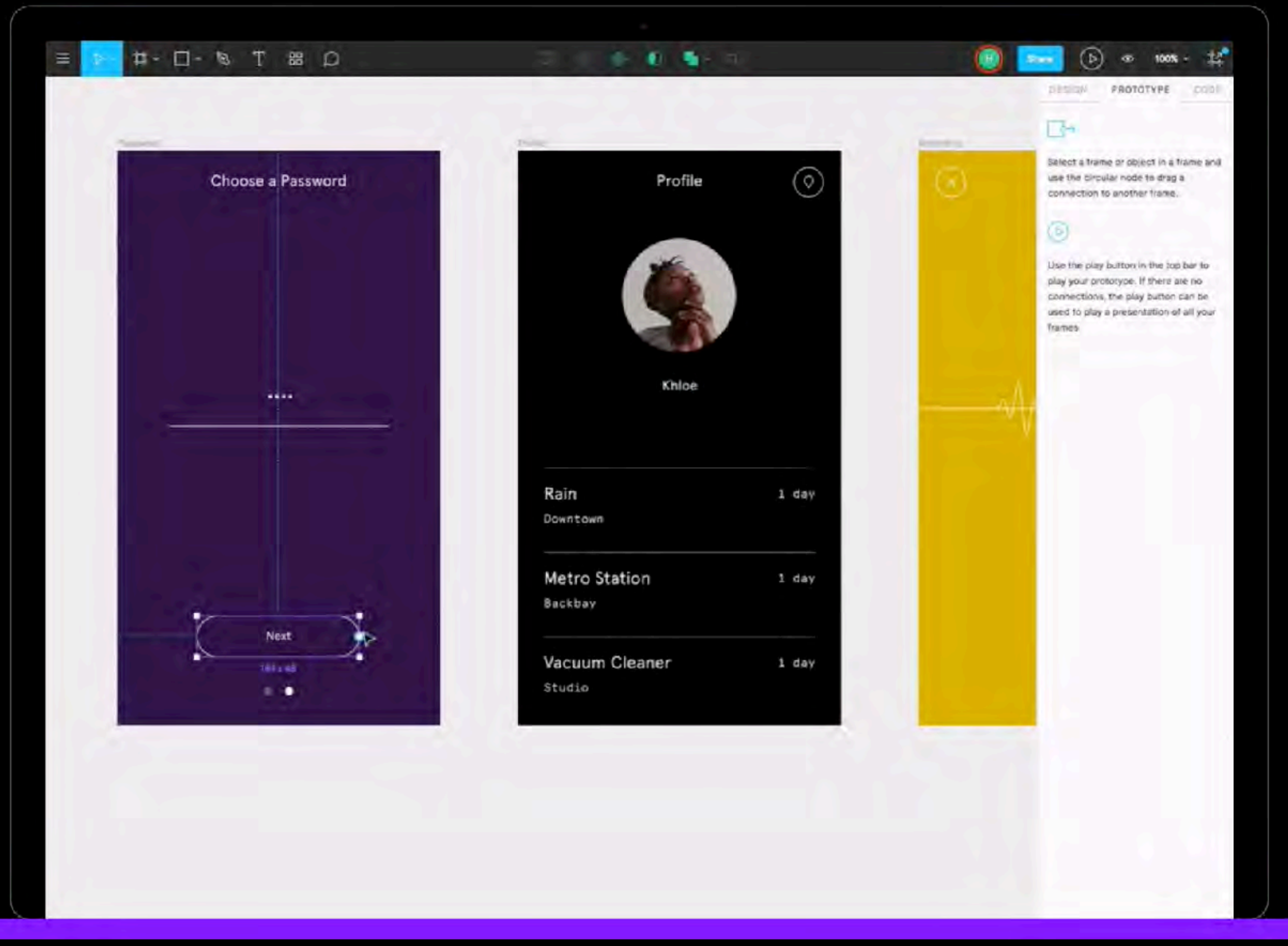
COMPUTER REQUIREMENTS

Full Adobe Creative Suite

Sufficient memory and disk space to run Adobe Suite, Android Studio and emulators

Printer access for paper prototypes

FIGMA


Share
100%
DESIGN
PROTOTYPE
CODE
Choose a Password
Next
Profile
Khloe
Rain
1 day
Downtown
Metro Station
1 day
Backbay
Vacuum Cleaner
1 day
Studio
Select a frame or object in a frame and use the circular node to drag a connection to another frame.
Use the play button in the top bar to play your prototype. If there are no connections, the play button can be used to play a presentation of all your frames

GOALS OF THE COURSE

Learn to design, prototype, evaluate interfaces

Discover tasks of prospective users

Cognitive/perceptual constraints that effect design

Techniques for evaluating an interface design

Importance of iterative design for usability

Technology used to prototype & implement UI code

How to work together on a team project

Communicate your results to a group

Many of these will be key aspects of your future jobs

CS160 HAS A HEAVY WORKLOAD

COURSE MECHANICS

Office Hours, Sections, Course Website, bCourses, Assignments

OFFICE HOURS ▪ SECTIONS

Office Hours

See our course webpage:

http://teaching.paulos.net/cs160_FL2018/

Sections

Section starts **THIS WEEK — FRIDAY**

Bring your laptop to section

Download and install Android Studio

Read Piazza info before section

SECTIONS FOR FIRST WEEK

Installing the Android SDK and working with the Android Emulator

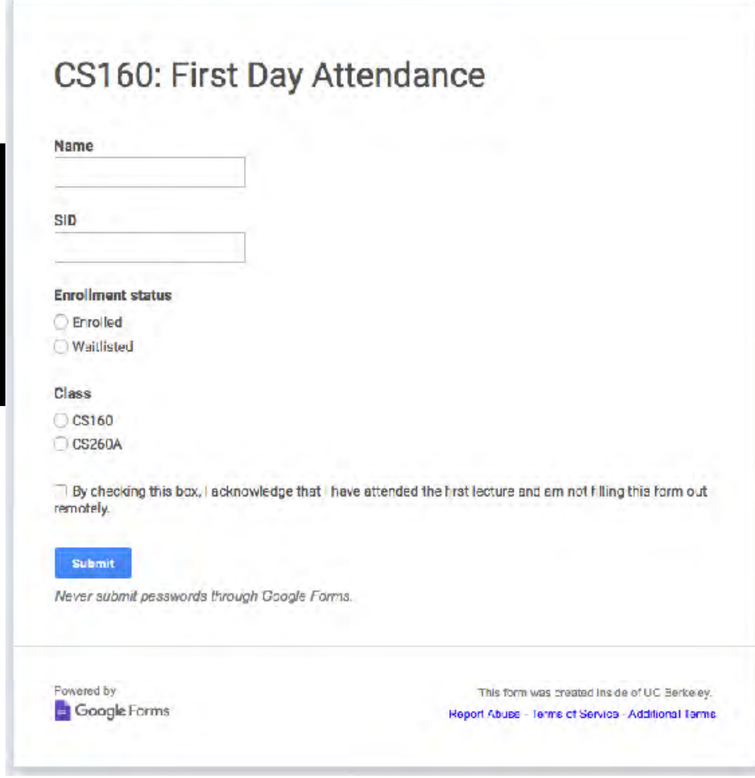
How to get started with your programming homework

Attend a section this Friday (THIS WEEK)

Which section? Fill out the doodle poll (see Piazza)

Section assignments after Friday

Stay tuned ... we will update which sections are going to be held



CS160 FALL 2018

http://tiny.cc/cs160

ASSIGNMENTS ARE ON THE SCHEDULE

Syllabus

WEEK 1

22 Aug Introduction (REQUIRED)

Slides
Assignment: Reading Response (due before class on 27 Aug)
Assignment: PROG 01: Electric Time (due by 11:59pm on 7 Sep)
Assignment: DESIGN 01: Watches in the Wild (due before class 5 Sep)

Section: Android Introduction

WEEK 2

27 Aug The Design Cycle, Brainstorming, and Critique

Slides
Reading: Rogers, Y., Sharp, H., & Preece, J. (2011). Interaction Design: Beyond Human-Computer Interaction (3rd ed. ed.), pp 9-18.

29 Aug Ubiquitous and Context Aware Computing

Slides
Reading: Mark Weiser. 1999. The Computer for the 21st Century. Scientific American, Sept 1991.

Section: Making Apps with Android

READINGS RESPONSE

Readings are very important to the class

Make sure you do the reading before class

Midterm will include topics only covered in readings

Readings will be posted on bCourses and Website

Online reading discussions (ongoing assignment)

You must respond to the reading prompt **before** class. We will not accept late comments.
Comments are a **major factor in your class participation grade**

Will be graded based on the overall quality of the response

2 = good

1 = partial

0 = very poor or missing response

REACHING US

Questions about course material, assignments

Piazza

Grades and Assignments

bCourses

Private questions

If other students will benefit from an answer, ask publicly on Piazza

If it's personal, use Piazza private messaging feature

Do not email us directly

ASSESSMENT

The goal of CS160 is to teach you to **design** and **evaluate** interfaces

Specific grading rubric guidelines will be given in each assignment

Good communication expected in your oral and written presentations

Groups self-assess participation
...you will help evaluate your team mates and vice versa

Much of CS160 is **qualitative** — there is not an exact correct answer but a landscape of well researched, executed, and designed solutions of varying excellence

GRADING

20% Participation (Attendance, Reading responses, class, Piazza)

20% Individual Programming & Design Assignments

25% Midterm

35% Project Assignments

POLICIES

Late Assignments

Most assignments will be due before class on the due date

Group assignments will not be accepted late

Individual programming and design assignments can use up to two 24 hour slip days:

1 min — 24 hours: one slip day (weekends count)

24 hours — two slip days

Slip Days are days and cannot be broken down into smaller units

You have exactly **two slip days this semester**

Cannot be used on group assignments or reading responses

Cheating (official)

Will get you an F in the course

More than once can get you dismissed from Cal

MORE ON ATTENDANCE

There are several required classes/sections this semester

They area all posted our class website

Today — Hey you made it...great job!

24 Sep — In class brainstorm

15 Oct — Midterm ... obviously

24 Oct — Studio

29 Oct — Studio

31 Oct — Studio 

5 Nov — Project Pitch

7 Nov — Project Pitch

14 Nov — Studio

19 Nov — Studio

26 Nov — Studio

28 Nov — Studio

4 Dec — Final Critique (During RRR)

5 Dec — Public Showcase (During RRR)

JACOBS INSTITUTE FOR DESIGN INNOVATION

CITRIS INVENTION LAB

Maker Pass

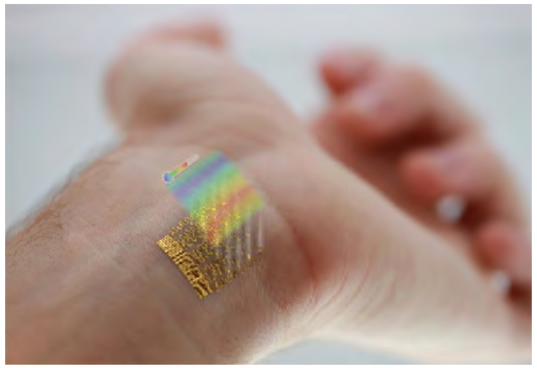
HCI OVERVIEW

HCI ▪ UI ▪ Usability ▪ Iterative Design

HUMAN

COMPUTER

INTERACTION



Björn Hartmann

Eric Paulos

John Canny

Anca Dragan

Armando Fox

Marti Hearst

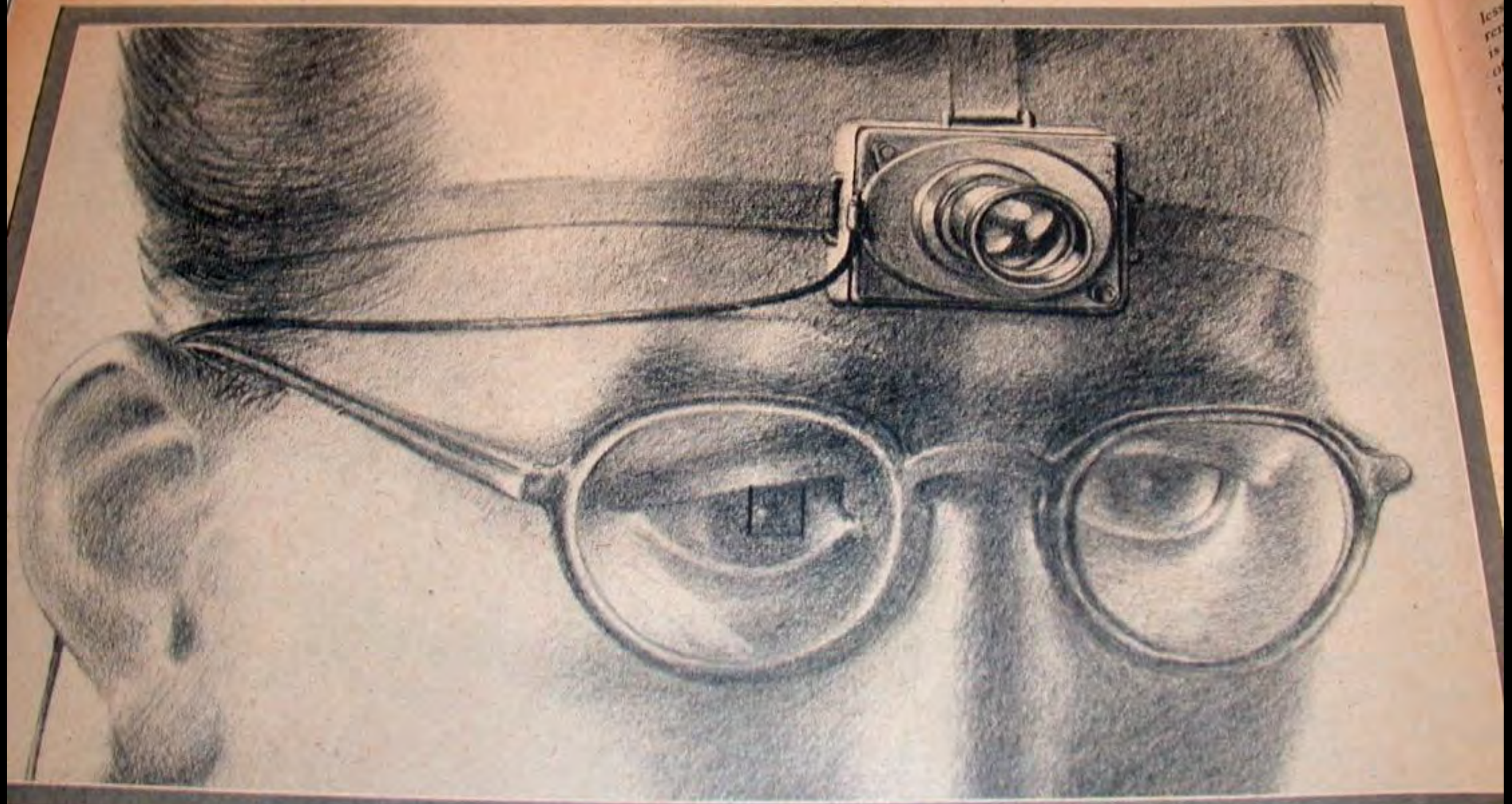
Kimiko Ryokai

Alice Agogino

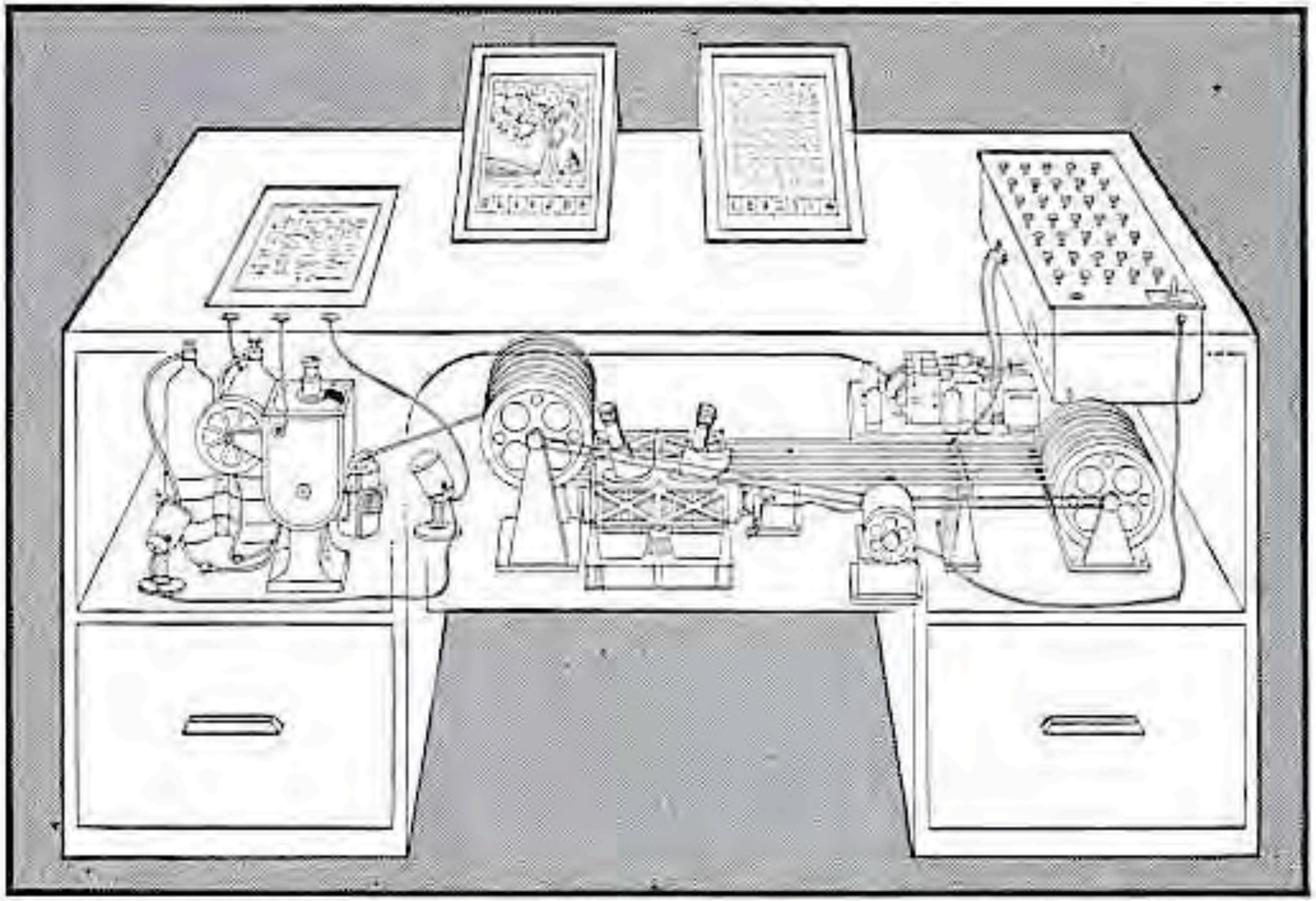
Greg Niemeyer

Ken Goldberg

Vannevar Bush (1945). "As We May Think," Atlantic Monthly 176 (July 1945) pp. 101-108.



THE FUTURE RECORDS EXPERIMENTS WITH A TINY CAMERA FITTED WITH UNIVERSAL-FOCUS LENS. THE SMALL SQUARE IN THE EYEGLASS AT THE LEFT SIGHTS THE O

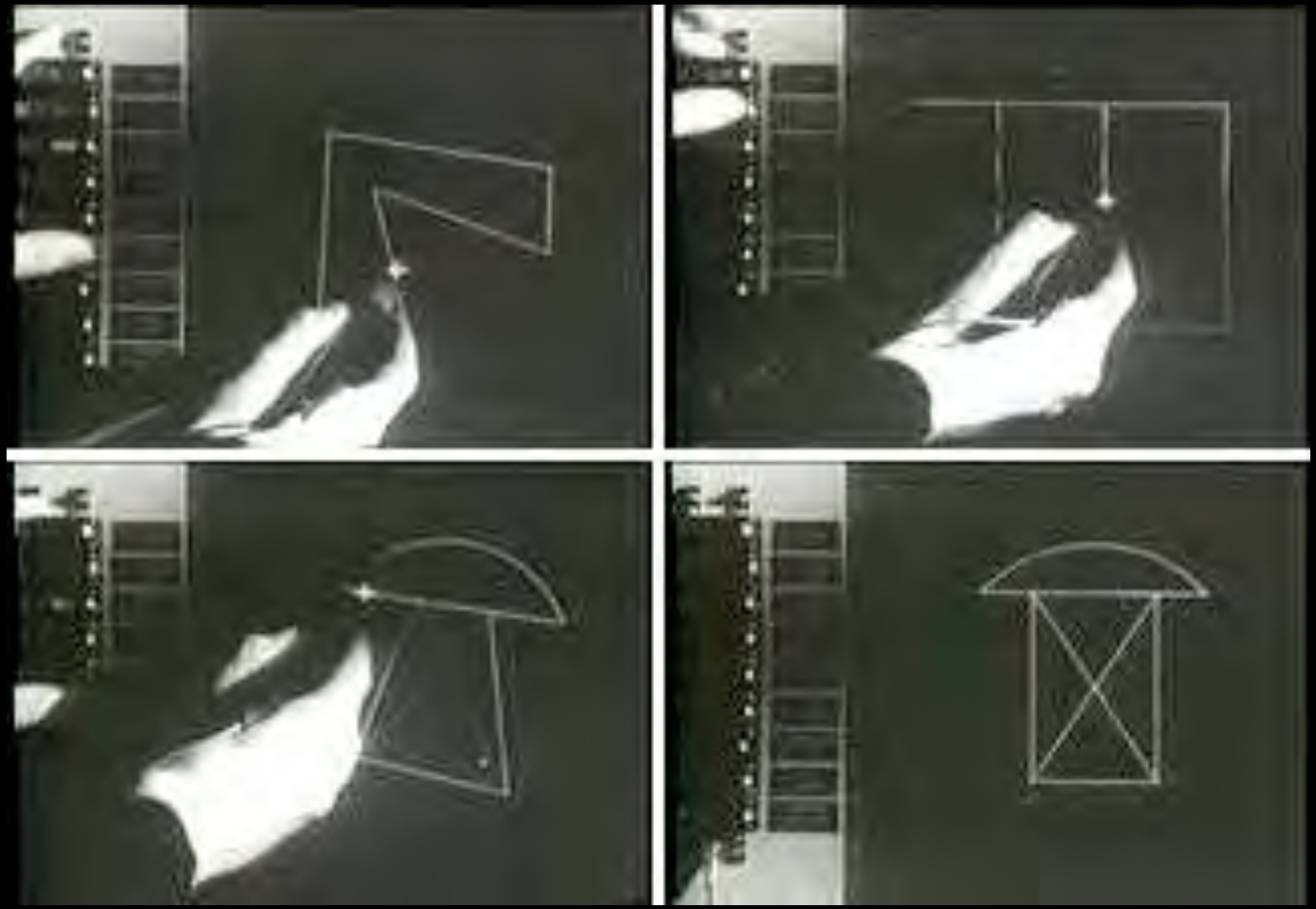


MEMEX in the form of a desk would instantly bring files and material on any subject to the operator's fingertips. Slanting translucent viewing screens magnify supermicrofilm filed by code numbers. At left is a mechanism which automatically photographs longhand notes, pictures and letters, then files them in the desk for future reference.

Memex inspires Ivan Sutherland

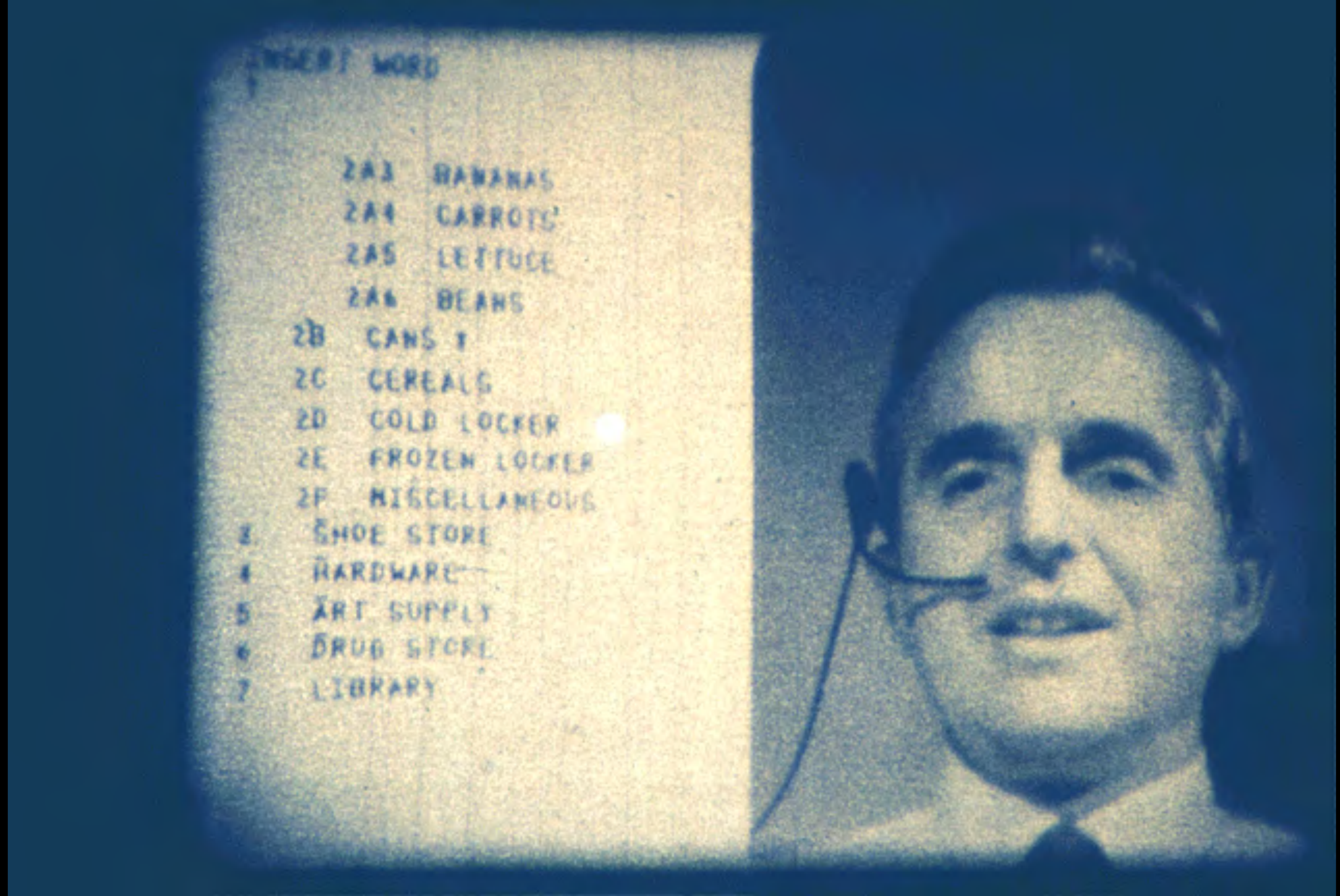
Ivan Sutherland. 1964. Sketch pad a man-machine graphical communication system. In Proceedings of the SHARE design automation workshop (DAC '64). ACM, New York, NY, USA, 6.329-6.346.


30



Ivan Sutherland.
1964. Sketch Pad

Sketch Pad inspires Doug Engelbart


WORD
2A3 BANANAS
2A4 CARROTS
2A5 LETTUCE
2A6 BEANS
2B CANS
2C CEREALS
2D COLD LOCKER
2E FROZEN LOCKER
2F MISCELLANEOUS
3 SHOE STORE
4 HARDWARE
5 ART SUPPLY
6 DRUG STORE
7 LIBRARY

THE MOTHER OF ALL DEMOS

Doug Engelbart's December 9, 1968, computer demonstration at the Fall Joint Computer Conference in San Francisco. The 90-minute presentation essentially demonstrated almost all the fundamental elements of modern personal computing

- windows
- hypertext
- graphics
- video conferencing
- the computer mouse
- word processing
- dynamic file linking
- revision control
- collaborative real-time editor

Control Devices

USAGE

APPLICATION EXAMPLES

TWO-PERSON COLLABORATION

INFORMATION RETRIEVAL (BILL)

Me (with hair) and Doug Engelbart in 1998

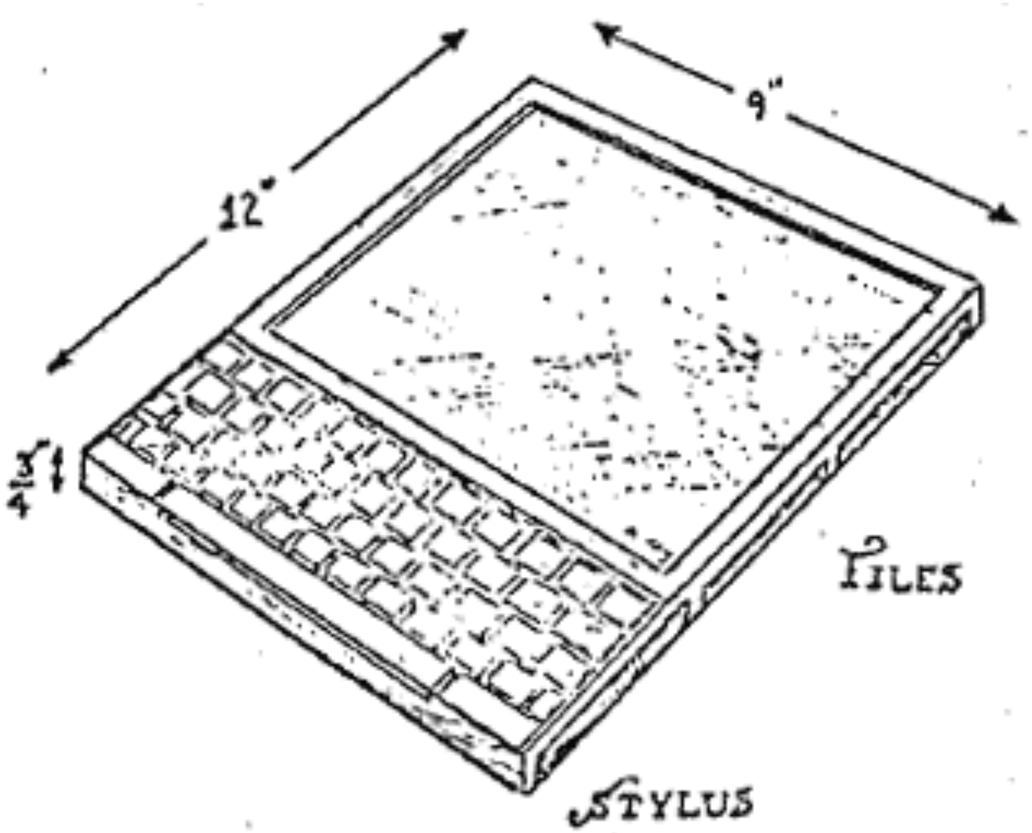
Engelbart inspires

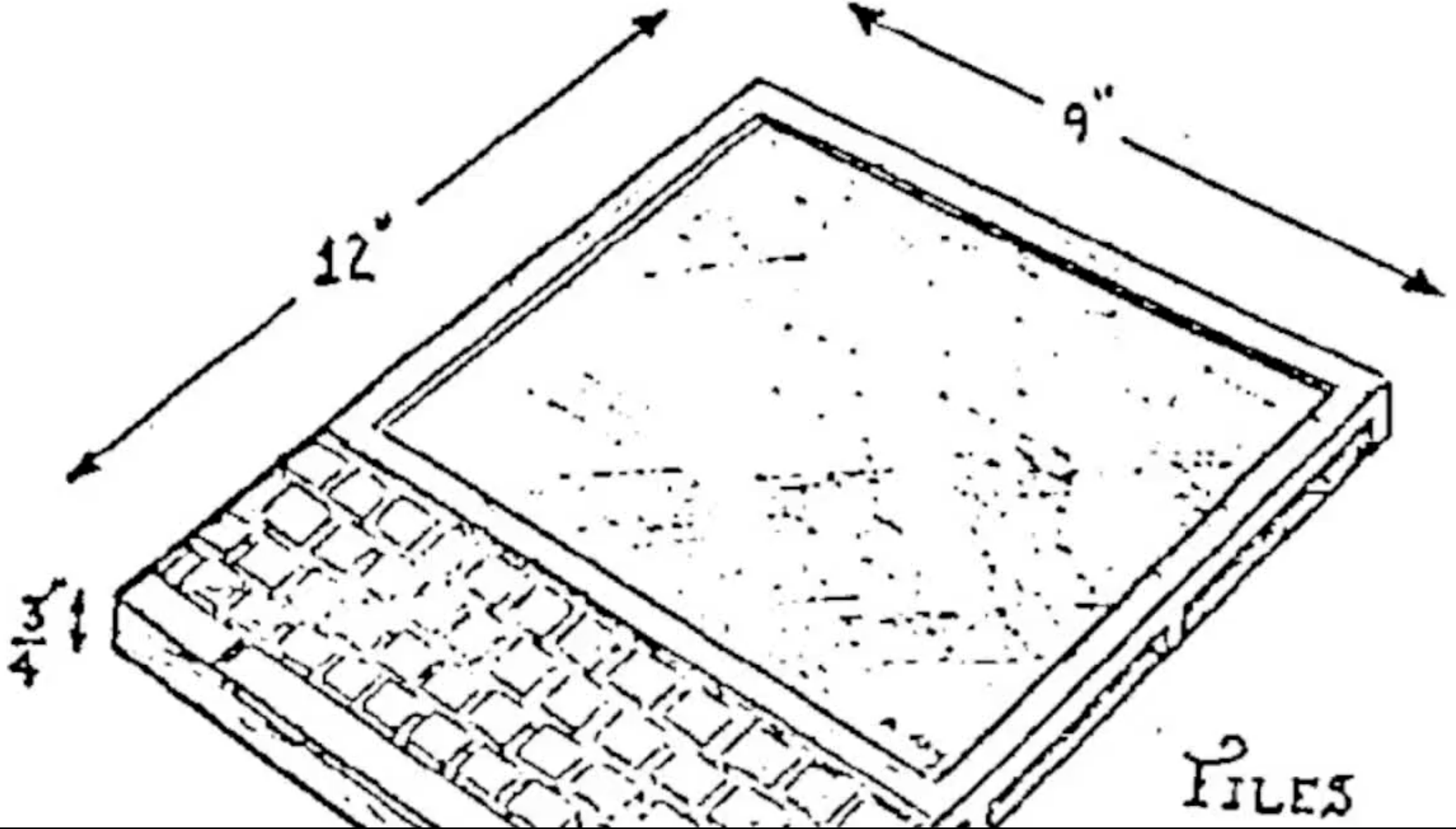
Alan Kay

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

DYNABOOK

A personal computer for children of all ages

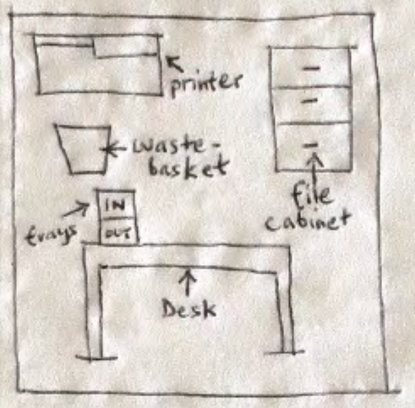




PILES

Engelbart inspires

Xerox PARC



Office Schematic

PRINT, FILE, DELETE, MAIL

↓

all are inter-doc actions

— " —

INTRA-DOC use cut & Paste physical metaphor

↓

What's analog for INTER-DOC ??

↓

Grab & Move!!!

Xero Alto (1973)

Xerox Star (1981)

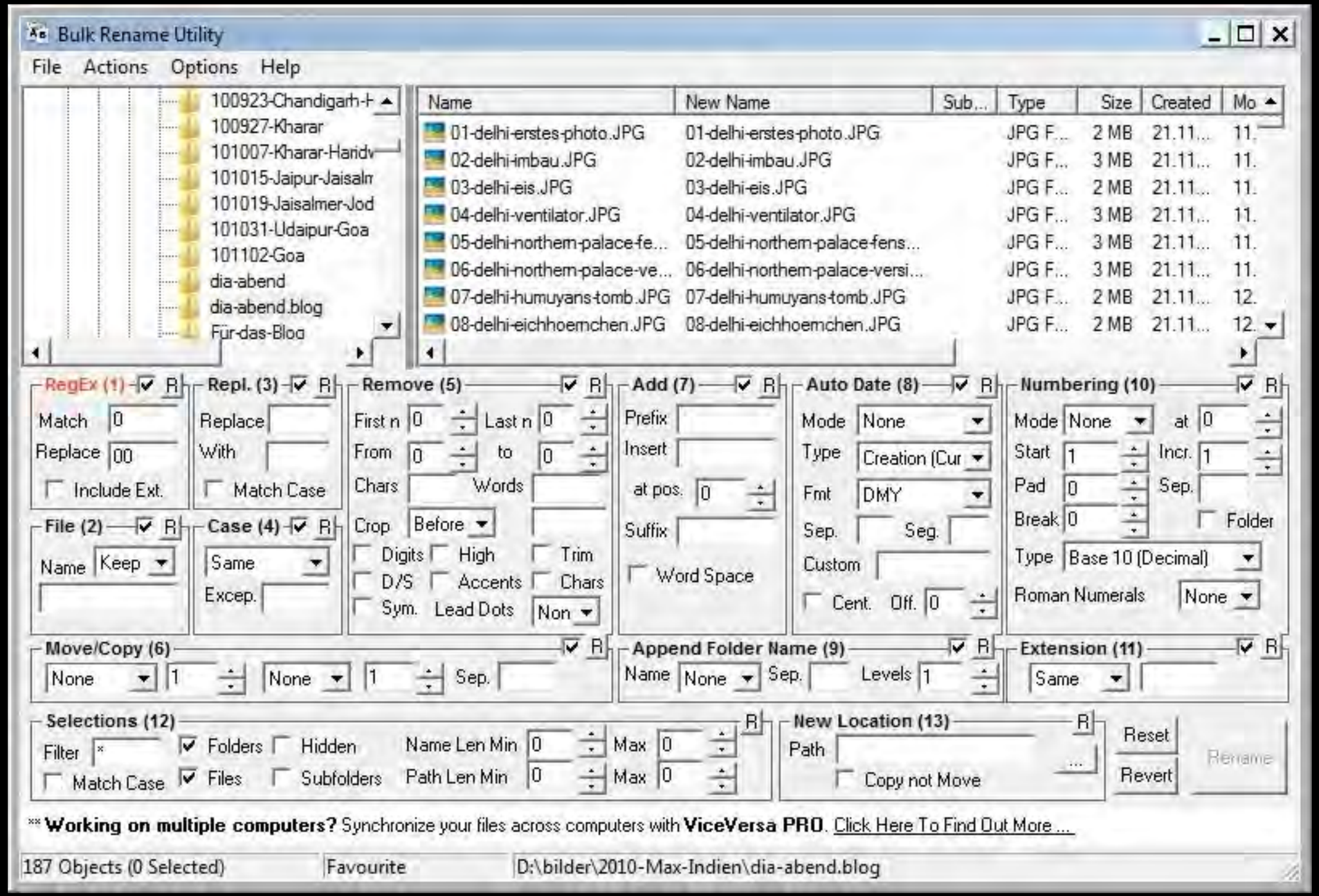
Xerox PARC inspires Steve Jobs

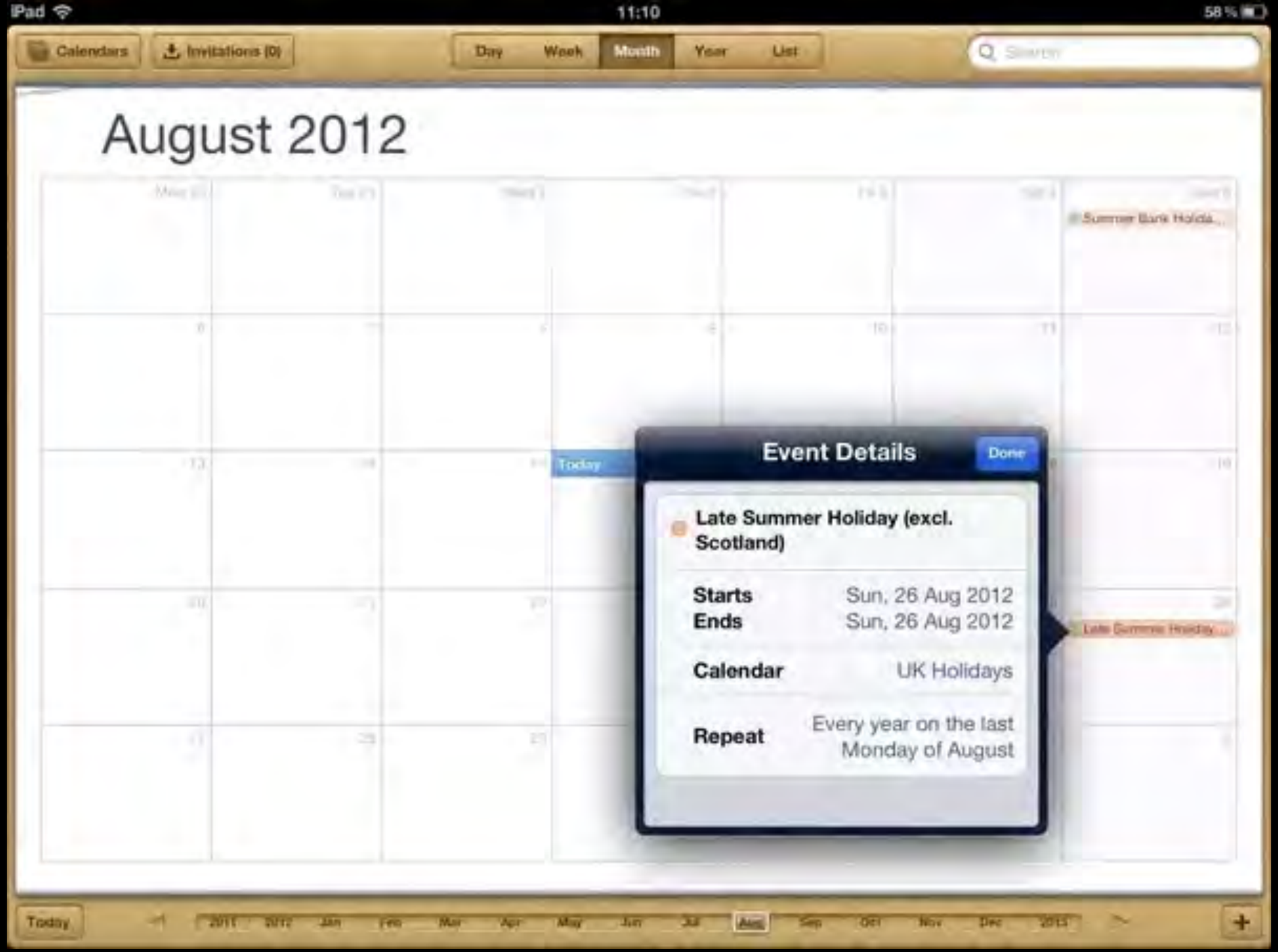

Apple Lisa (1983)


TOKYU
2PM

Sara Kiesler (1984)
Social psychological aspects of computer-mediated communication

WARNING


Bulk Rename Utility
File Actions Options Help
100923-Chandigarh-H
100927-Kharar
101007-Kharar-Haridv
101015-Jaipur-Jaisaln
101019-Jaisalmer-Jod
101031-Udaipur-Goa
101102-Goa
dia-abend
dia-abend.blog
Für-das-Blog
Name
New Name
Sub...
Type
Size
Created
Mo
01-delhi-erstes-photo.JPG
02-delhi-imbau.JPG
03-delhi-eis.JPG
04-delhi-ventilator.JPG
05-delhi-northern-palace-fe...
06-delhi-northern-palace-ve...
07-delhi-humuyans-tomb.JPG
08-delhi-eichhoernchen.JPG
JPG F...
2 MB
21.11...
RegEx (1)
Match
Replace
Include Ext.
Repl. (3)
Replace
With
Match Case
Remove (5)
First n
Last n
From
to
Chars
Words
Crop
Before
Digits
High
Trim
D/S
Accents
Chars
Sym.
Lead Dots
Non
Add (7)
Prefix
Insert
at pos.
Suffix
Word Space
Auto Date (8)
Mode
None
Type
Creation (Cur
Fmt
DMY
Sep.
Seg.
Custom
Cent.
Off.
Numbering (10)
Mode
None
at
Start
Incr.
Pad
Sep.
Break
Folder
Type
Base 10 (Decimal)
Roman Numerals
None
File (2)
Name
Keep
Case (4)
Same
Excep.
Move/Copy (6)
None
Sep.
Append Folder Name (9)
Name
None
Sep.
Levels
Extension (11)
Same
Selections (12)
Filter
Match Case
Folders
Files
Hidden
Subfolders
Name Len Min
Path Len Min
Max
New Location (13)
Path
Copy not Move
Reset
Revert
Rename
** Working on multiple computers? Synchronize your files across computers with ViceVersa PRO. Click Here To Find Out More ...
187 Objects (0 Selected)
Favourite
D:\bilder\2010-Max-Indien\dia-abend.blog


iPad
11:10
58 %
Calendars
Invitations (0)
Day
Week
Month
Year
List
August 2012
Today
Event Details
Done
Late Summer Holiday (excl. Scotland)
Starts
Sun, 26 Aug 2012
Ends
Sun, 26 Aug 2012
Calendar
UK Holidays
Repeat
Every year on the last Monday of August
Today


ADD FARE
ADD FARE
ADD FARE


moving!
Set up Clipper
and
be on your way!
BART
TICKETS
COINS
BILLS
TOUCH CARD
ON DISK TO
RIGHT
TICKET
ATM

WHY STUDY USER INTERFACES?

The results show that in today's applications, an average of **48% of the code is devoted to the user interface** portion.

The average time spent on the user interface portion is

45% during the design phase
50% during the implementation phase
37% during the maintenance phase

– Myers & Rosson, CHI’92

WHY STUDY USER INTERFACES?

Major part of work for “real” programs (approx 50%)

You will work on “real” software

Intended for people other than yourself

Bad user interfaces cost

Money, Lives, Votes, ...

User interfaces are hard to get right

People are unpredictable

WHO BUILDS INTERFACES?

Ideally a team of specialists

- graphic designers
- interaction / user experience designers
- technical writers
- marketers
- test engineers
- software engineers
- customers

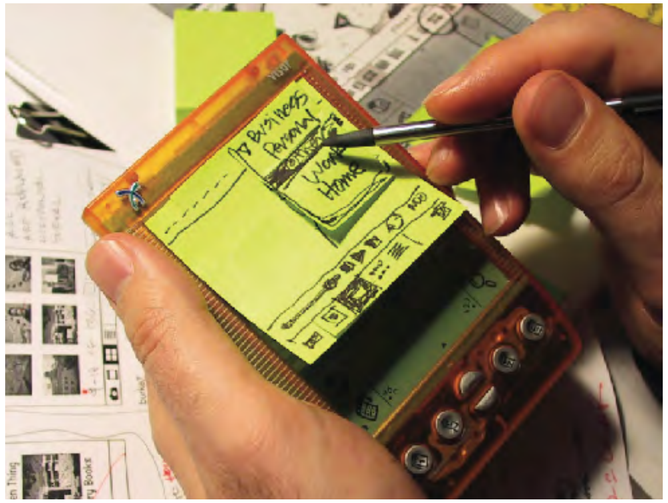
OBSERVE ▪ INTERVIEW ▪ STUDY

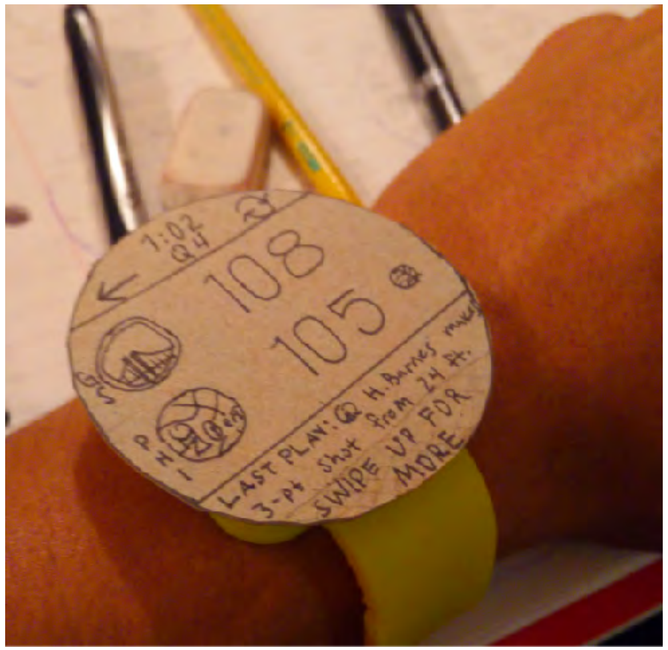
Observe existing practices

Create scenarios of actual use

Create models to gain insight into work processes

RAPID PROTOTYPING





Build a mock-up of design (or more!)

Low fidelity techniques

Paper sketches

Cut, copy, paste

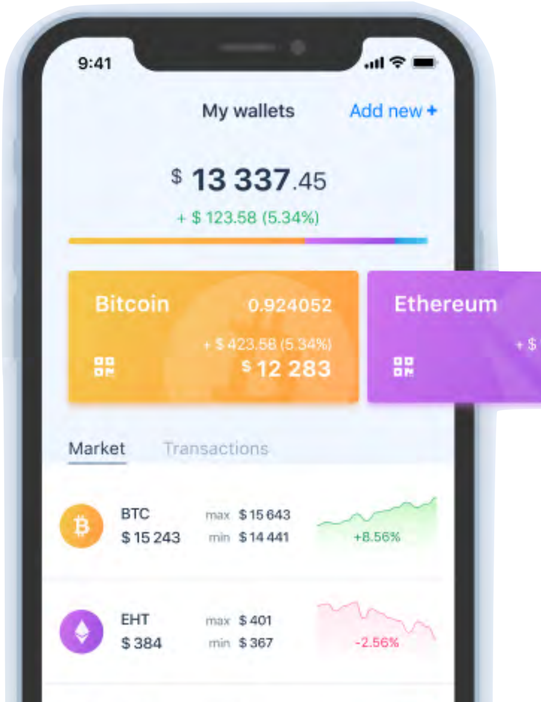
Video segments

Interactive prototyping tools

HTML, Figma...

UI builders

Android Studio



EVALUATION

Evaluate analytically (no users)

Test with real target users

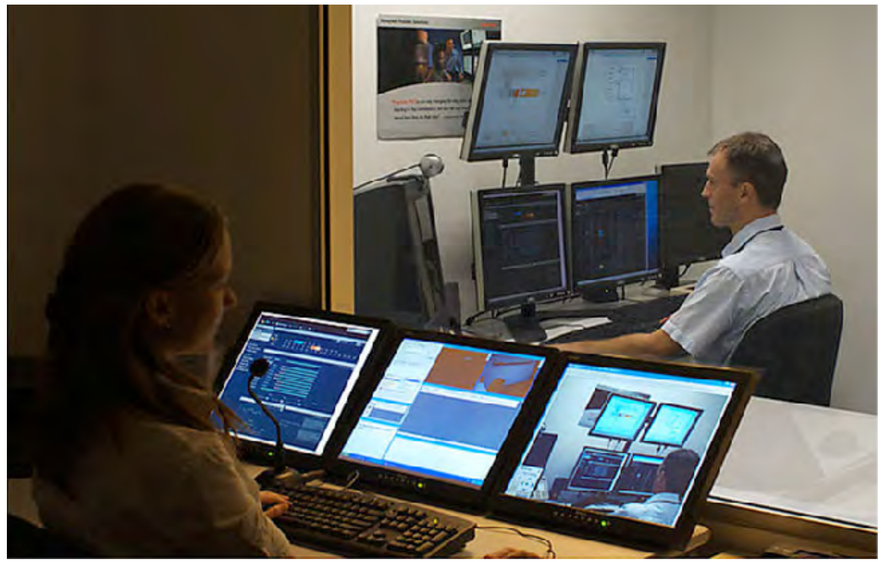
Low-cost techniques

expert evaluation

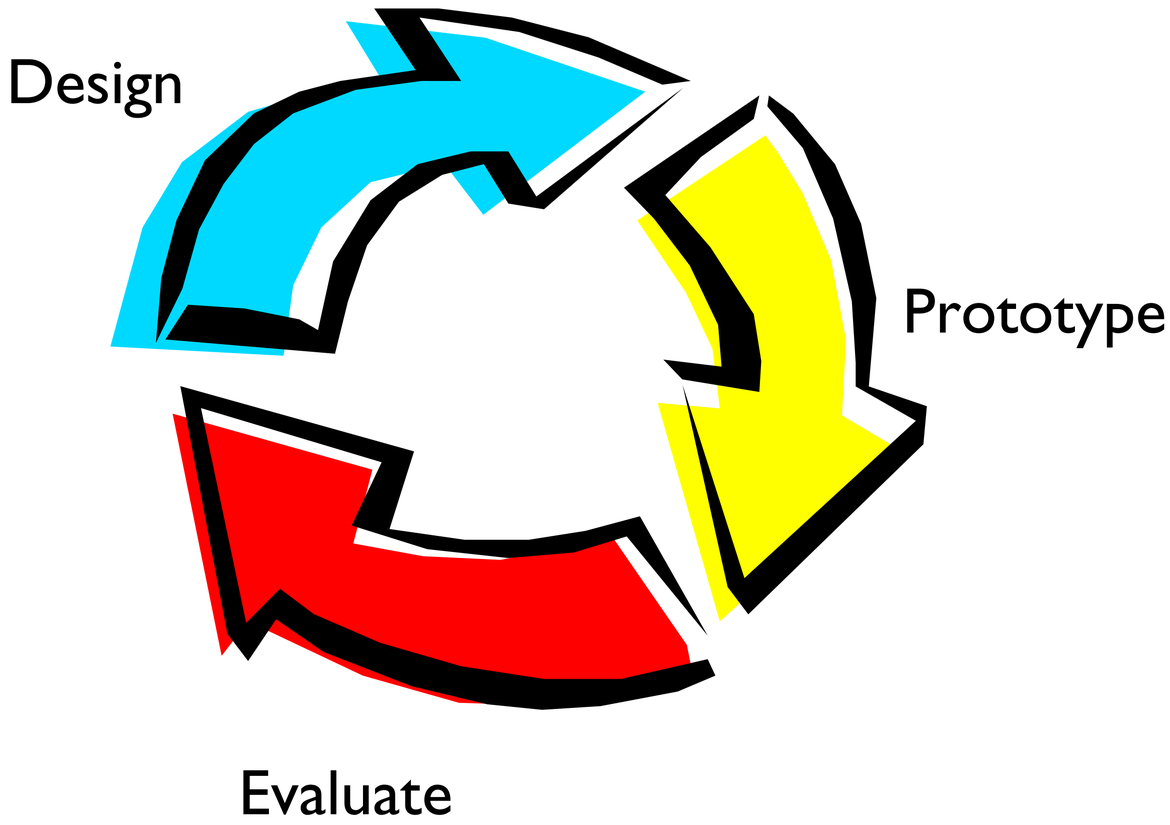
walkthroughs

Higher cost

Controlled usability study



INTERFACE DESIGN CYCLE



ASSIGNMENTS

DESIGN 01: WATCH IN THE WILD

The **goal of this assignment is to introduce you to iterative design**

That way, during the main course project, the steps of the design process will be more familiar

You will

observe and interview users

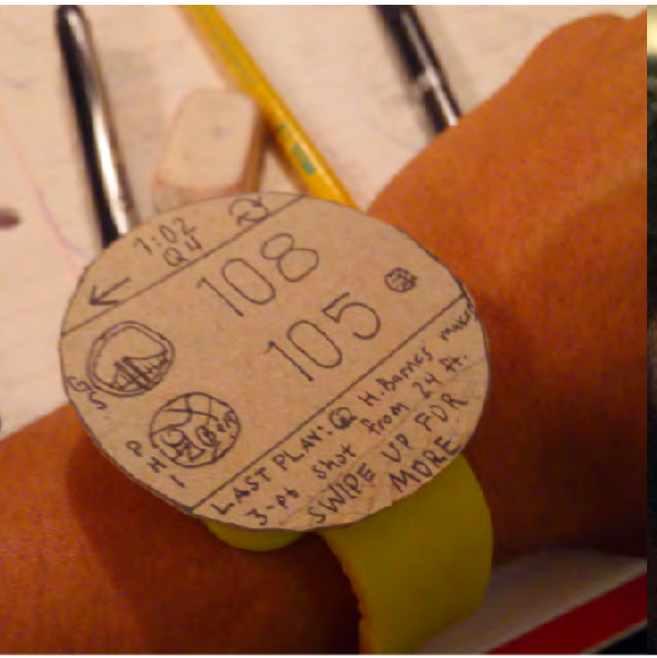
brainstorm

prototype

get feedback

DUE BEFORE CLASS 5 SEP

PAPER PROTOTYPING



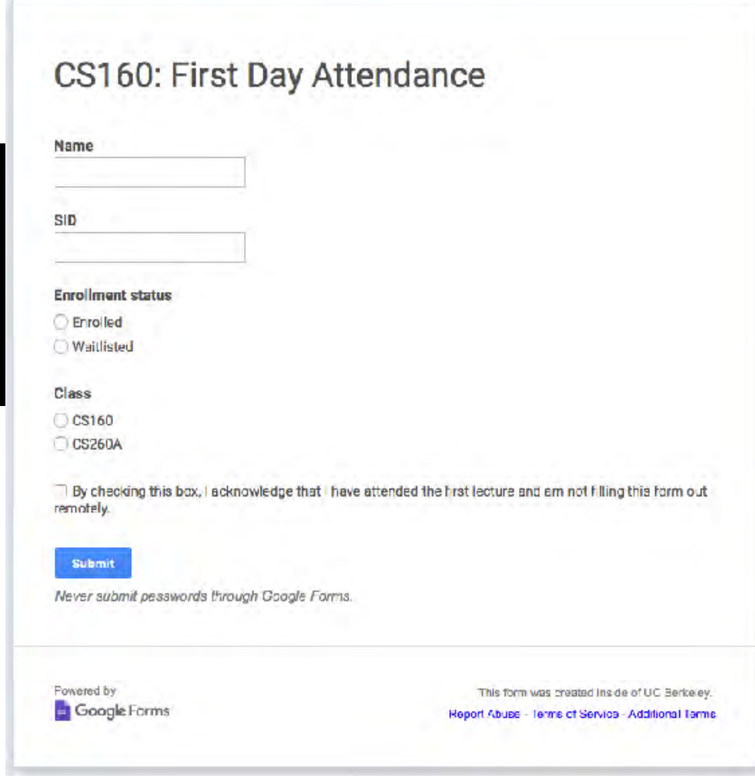
PROG 01: ELECTRIC TIME

DUE 11:59PM 7 SEP

IF THIS IS NOT THE CLASS FOR YOU

PLEASE DROP IMMEDIATELY!

GIVE OTHERS A FAIR CHANCE TO GET IN



CS160 FALL 2018

http://tiny.cc/cs160