

# Course Introduction

Irene Rae  
Computer Sciences  
University of Wisconsin–Madison

CS-570 Introduction to Human-Computer Interaction



# HCI

## What is it?

“...a discipline concerned with the design,  
evaluation and implementation of interactive  
computing systems for human use and with  
the study of major phenomena surrounding  
them.”

— ACM

Where does **HCI** fit  
within Computer  
Science?

**“The old computing is about what  
computer can do, the new  
computing is about what people  
can do.”**

**— Schneiderman, 2002**

The human world

**New Computing**

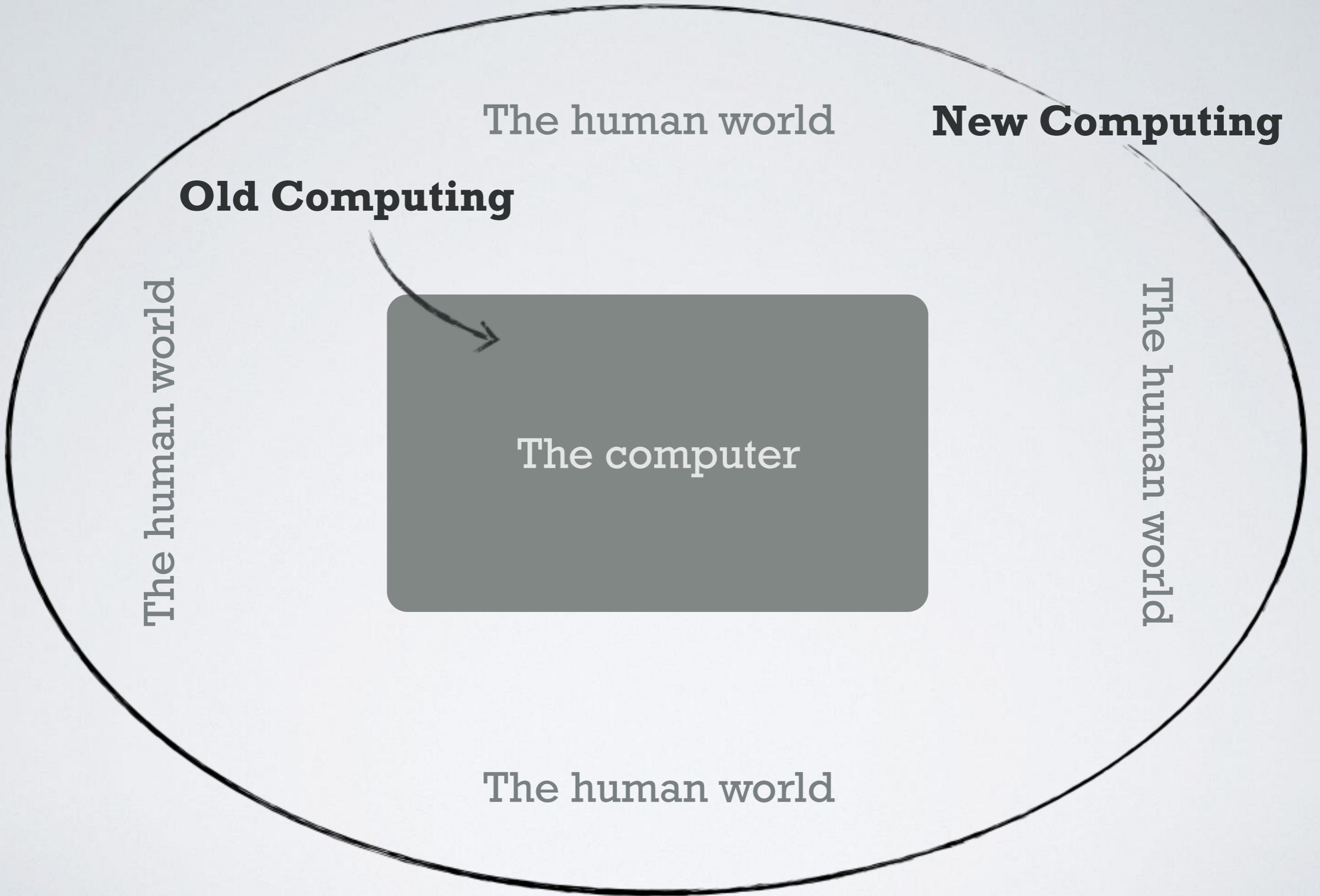
**Old Computing**

The human world

The human world

The computer

The human world





**What is wrong with  
these pictures?**





twitter

**WineTwits**

Following

Have you pre-registered to be part of the BETA launch of WineTwits.com? Do it now at <http://beta.winetwits.com> RT about 14 hours ago from Tweetie

@anikahangel I'm lobbying for Gran Torino!



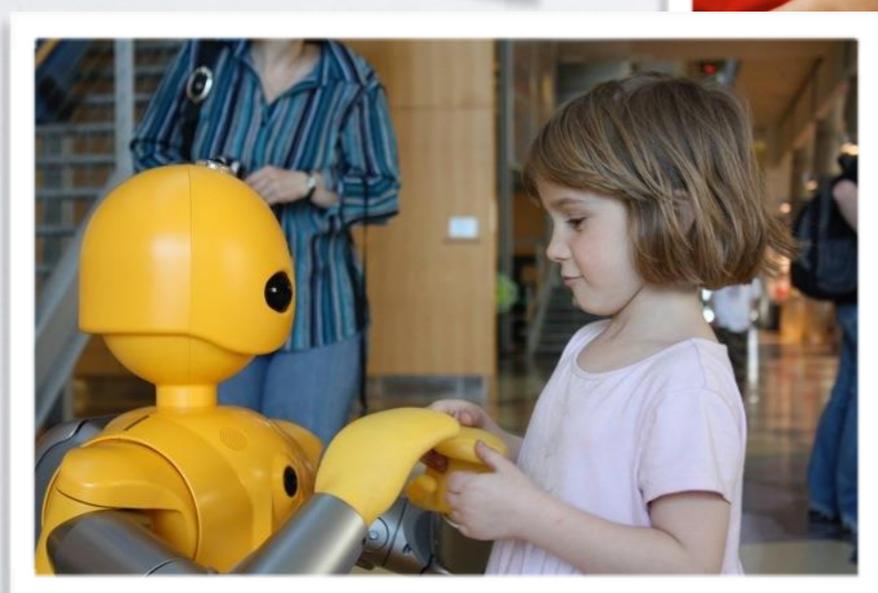
AT&T 3G 7:11 PM

Google Gmail Calendar Latitude more

Alice Seiberg 13m ago Palo Alto, CA

Friends list

Menu



**What is this class  
about?**

**This class is about**  
**identifying**  
**design problems**

This class is about **identifying** design problems

**+** **understanding**

**user needs**

This class is about **identifying** design problems  
+ **understanding** user needs

+ **designing**  
**interfaces**

This class is about **identifying** design problems  
+ **understanding** user needs  
+ **designing** interfaces

+ **testing** whether a  
design is good

This class is about **identifying** design problems

+ **understanding** user needs

+ **designing** interfaces

+ **testing** whether a design is good

+ **making sure that the  
design meets certain  
goals.**

This class is about **identifying** design problems

+ **understanding** user needs

+ **designing** interfaces

+ **testing** whether a design is good

+ making sure that the design meets certain **goals.**

# Saving Millions

## Project Ernestine

NYNEX was going to buy new workstation for their telephone operators

Each second saved per call saves \$3M/yr.

Gray et al.\* used CPM-GOMS to model use of new workstation

Discovered it would be 3% slower than original

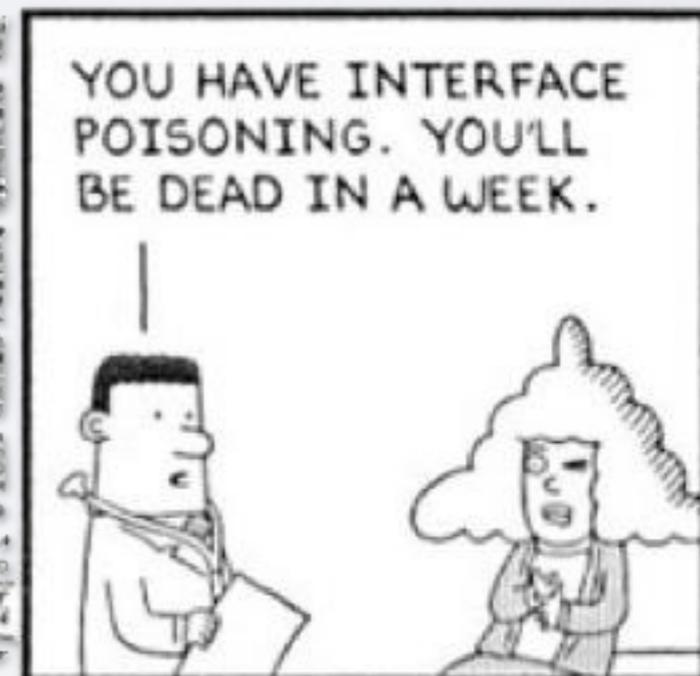
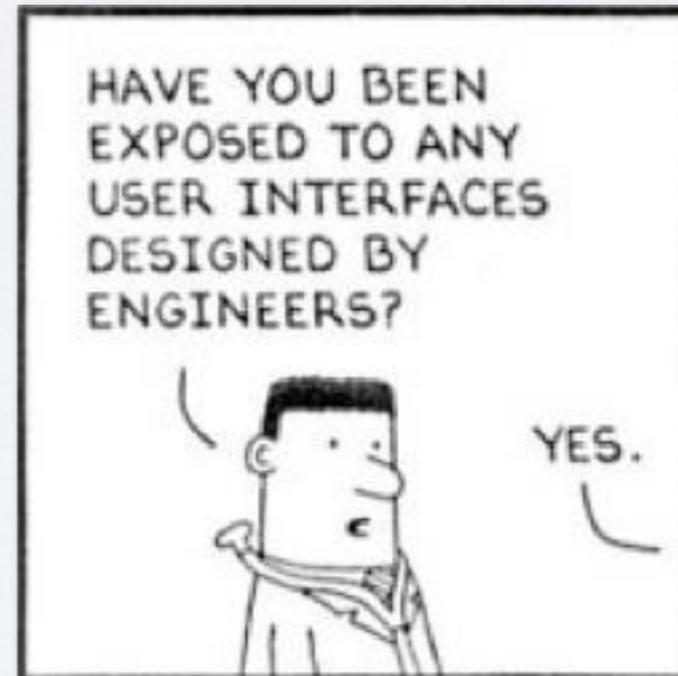
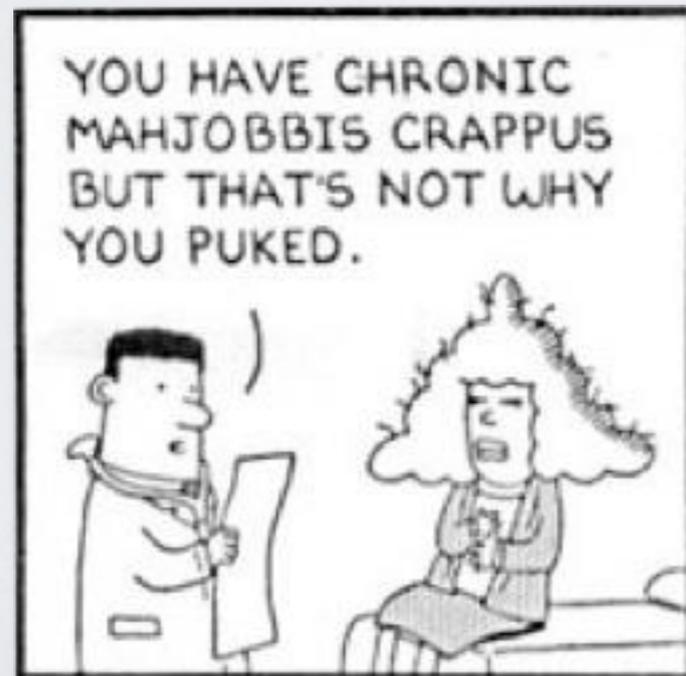
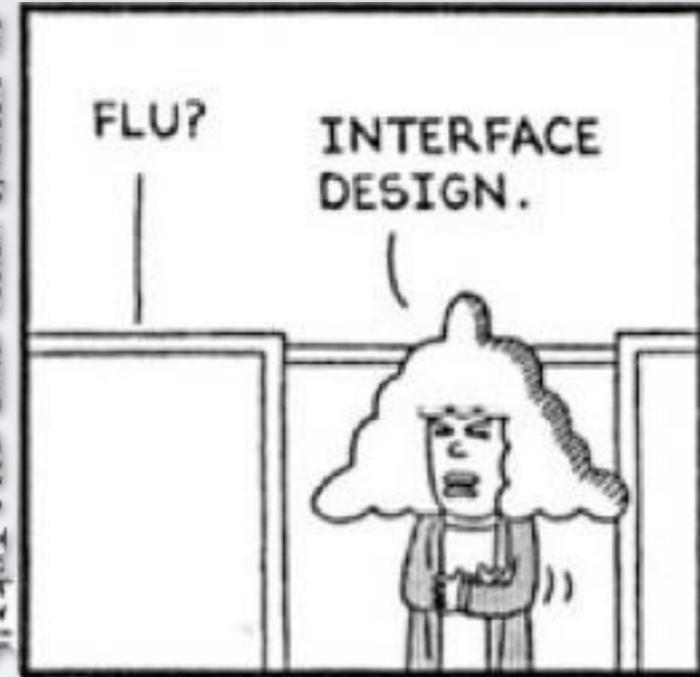
NYNEX did not buy workstation

Prevented mistake, saved \$2M/yr.

\* Gray, W. D., John, B. E. & Atwood, M. E. (1992). "The Precis of Project Ernestine or an overview of a validation of GOMS". Proceedings of the SIGCHI conference on Human factors in computing systems.

<http://dx.doi.org/10.1145%2F142750.142821>

# NOT KILLING PEOPLE



9/24/02 © 2002 United Feature Syndicate, Inc.

9/24/02 © 2002 United Feature Syndicate, Inc.

# No, Literally!\*

!!\$rhi Iran Air 655 Airbus shot down by USS Vincennes' missiles (290 dead);

Human error plus **confusing and incomplete Aegis interface** (S 13 4);

Commentary on Tom Wicker article on Vincennes and SDI (S 13 4);

**Aegis user interface changes recommended**; altitude, IFF problems (S 14 1);

**Analysis implicates Aegis displays** and crew (Aerospace America, Apr 1989);

Discussion of further intrinsic limitations (Matt Jaffe, S 14 5, R 8 74);

USS Sides Cmdr David Carlson questions attack on Iranian jet (S 14 6)

\*V\$fmhi 2nd JAS 39 Gripen crash 8Aug1993 blamed on pilot/technology (S 18 4:11);

**interface difficulties**, complicated analysis (S 19 1:12)

!!Vfih 1994 China Air A300-600 Nagoya accident killing 264: final report blames pilots and autopilot **human-computer interface** (R 18 33); (see also R 16 05-07, 09, 13-16)

\* Neumann, P. G. 1992. Illustrative risks to the public in the use of computer systems and related technology. SIGSOFT Softw. Eng. Notes 17, 1 (January 1992), 23-32.

<http://doi.acm.org/10.1145/134292.134293>

# Less Lethal Bad Designs

\*

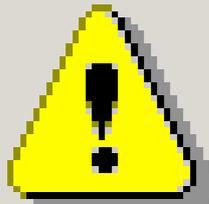


\* Hall of Shame.

<http://homepage.mac.com/bradster/iarchitect/metaphor.htm>

# Less Lethal Bad Designs

Adobe Illustrator



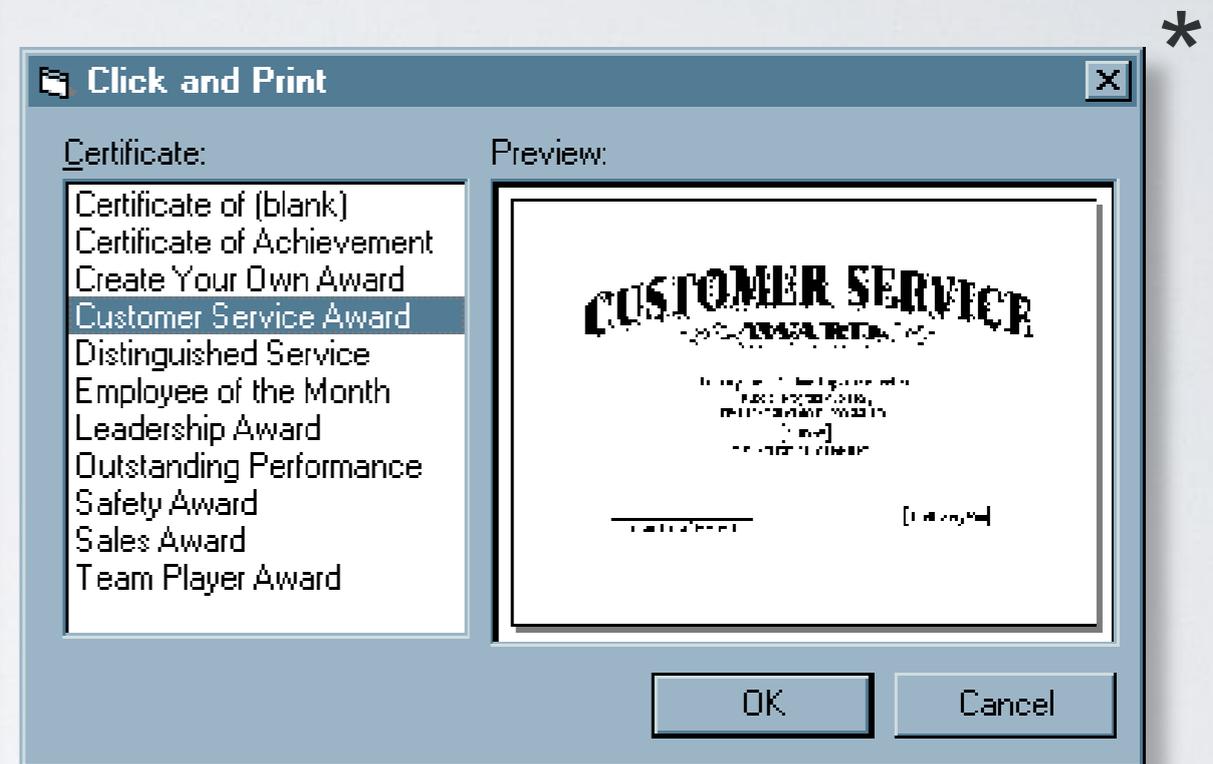
You are saving this document in Adobe Illustrator 9.0 format. Saving this document in an older format may disable some editing features when the document is read back in.

Yes

No

\*

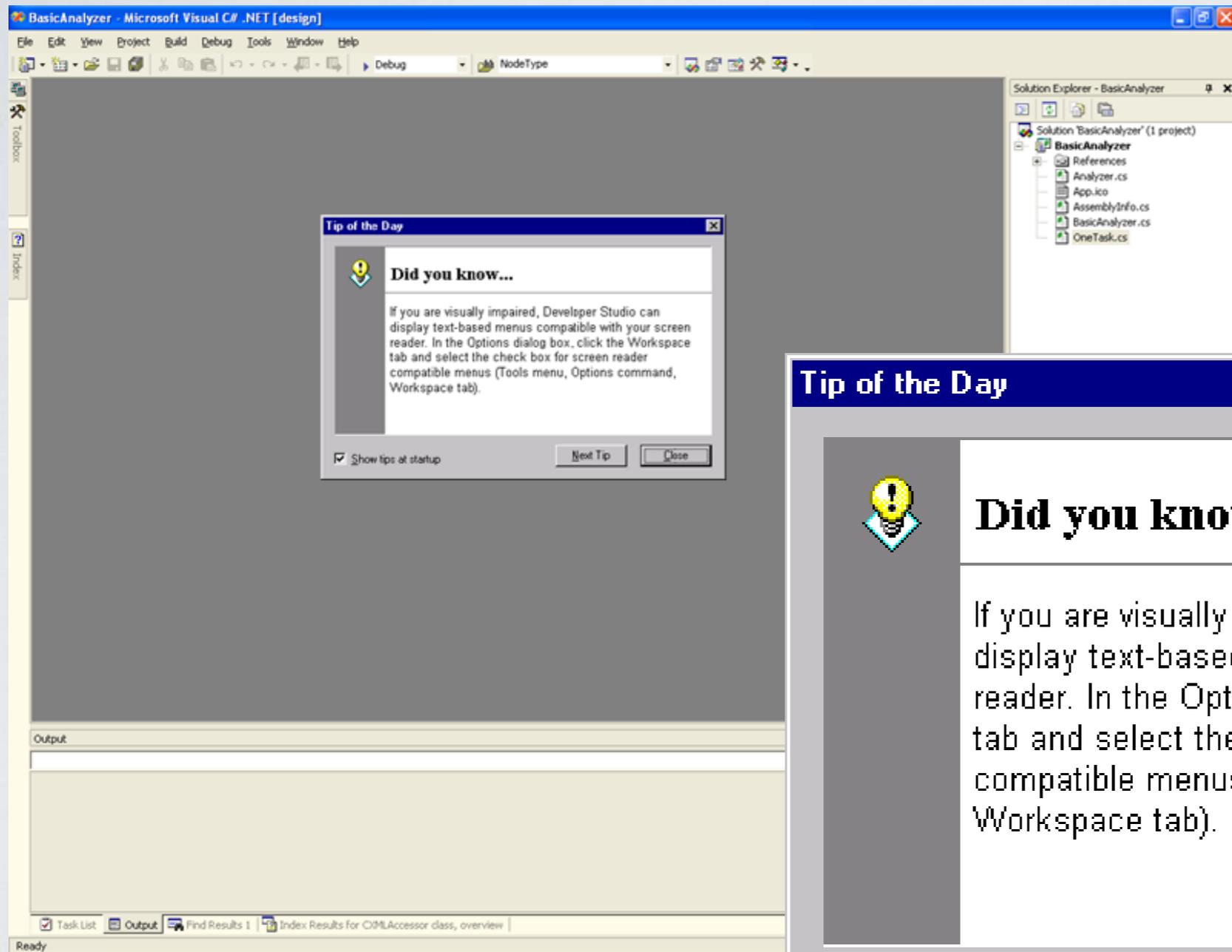
# Less Lethal Bad Designs



\* Hall of Shame.

<http://homepage.mac.com/bradster/iarchitect/controls.htm>

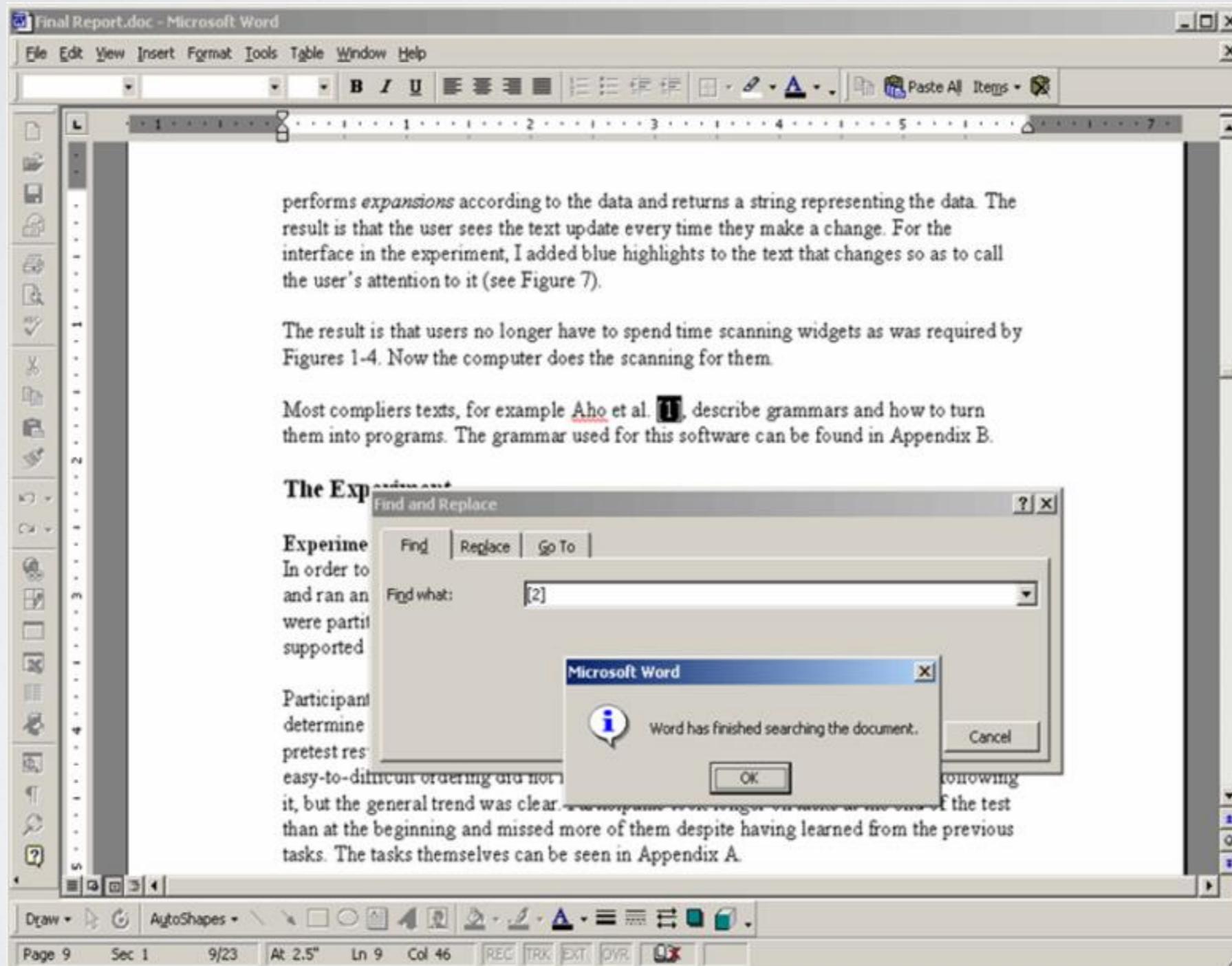
# Embarrassingly Bad Designs



\*



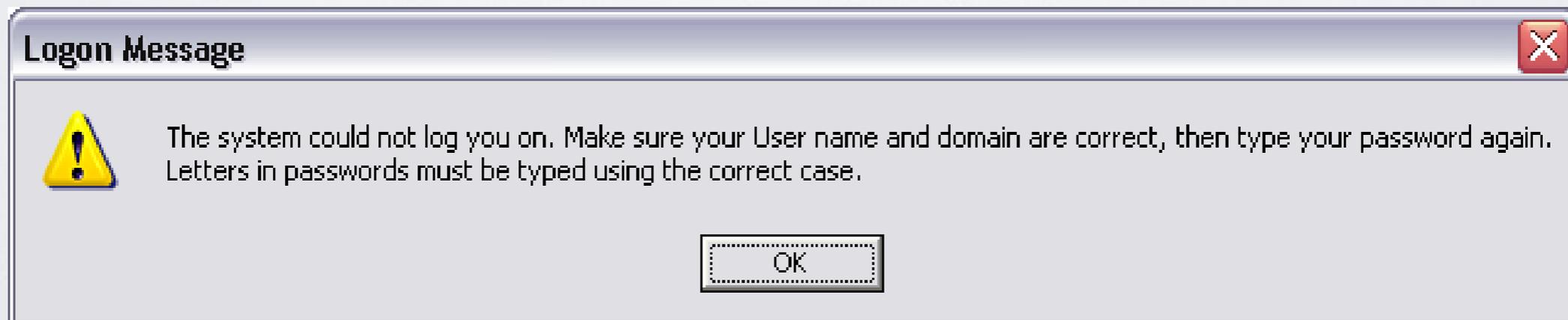
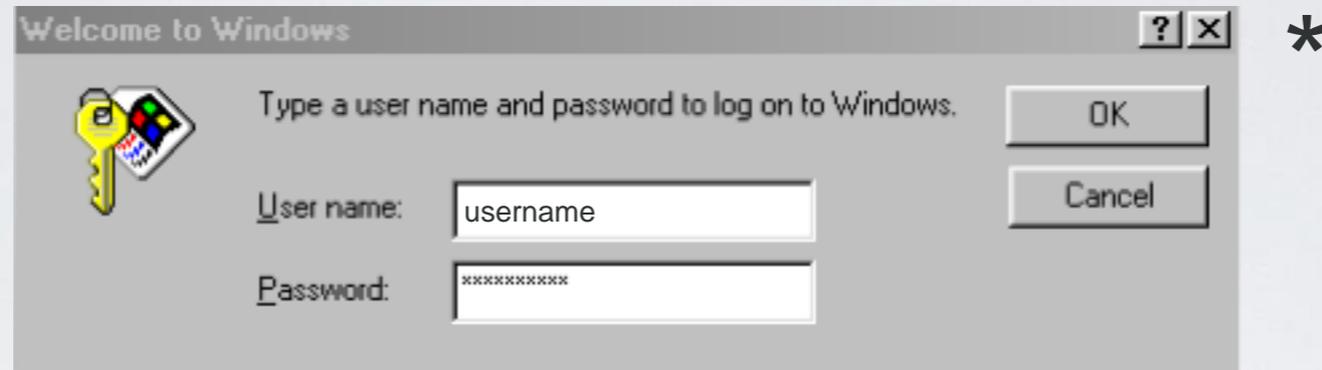
# Mildly Lethal Bad Designs



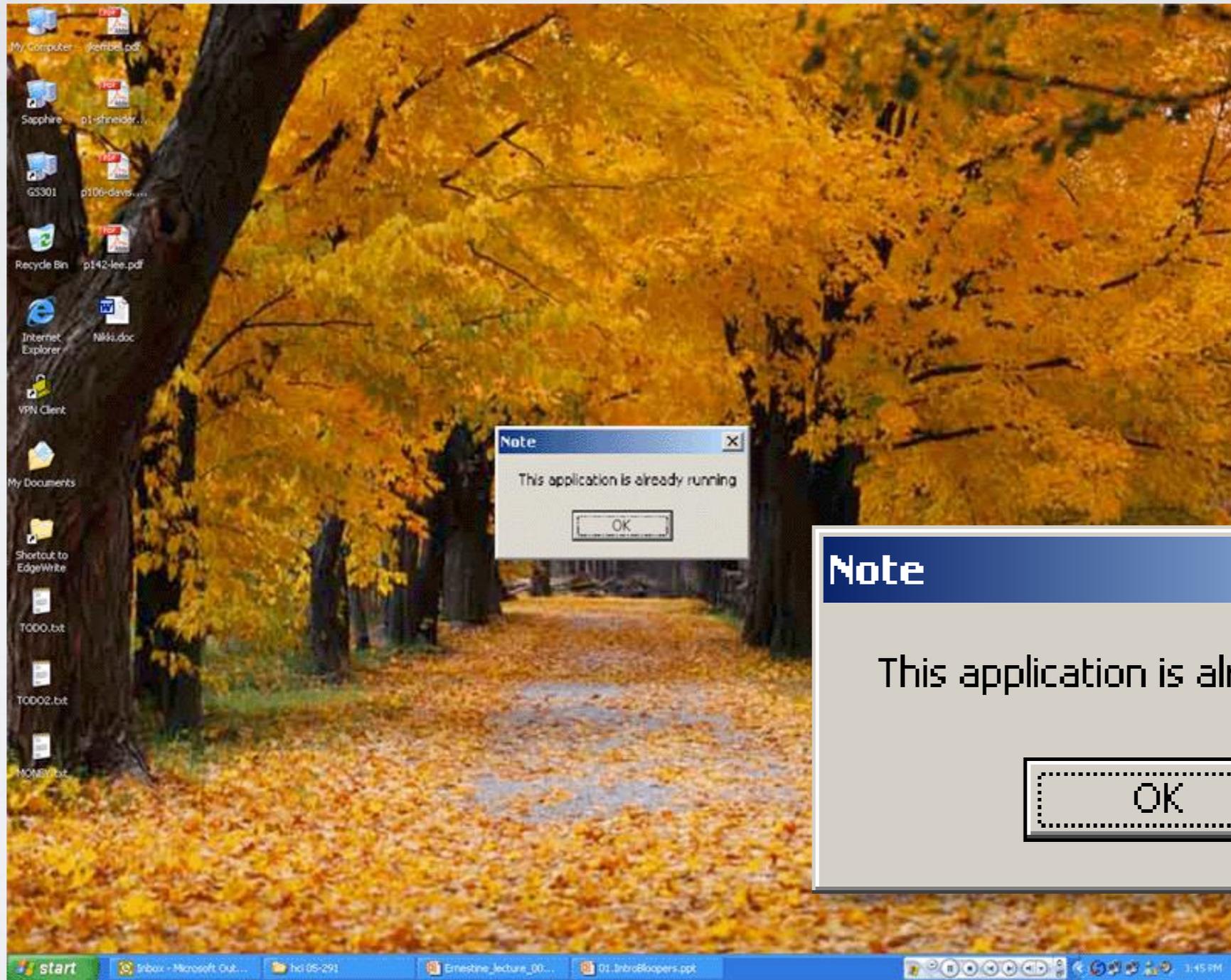
\*

\* Microsoft Word

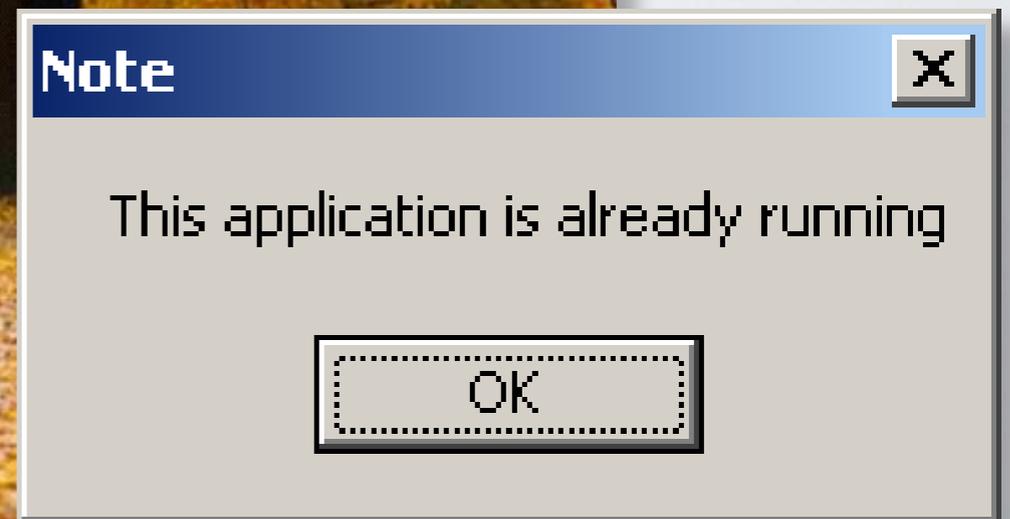
# Emotionally Abusive Interfaces



# Interfaces With Complete Clarity



\*



\* Microsoft Windows

**A change of topics**

# Course Outline

# Your Instructor

Office hours:

Wednesdays 9:30-11:30am

CS-5397

# Your TA

Office hours:

Tuesdays 1:00-3:00pm

CS-1302

# On the waitlist?

E-mail: [adpeer@wisc.edu](mailto:adpeer@wisc.edu)

For access to the course website

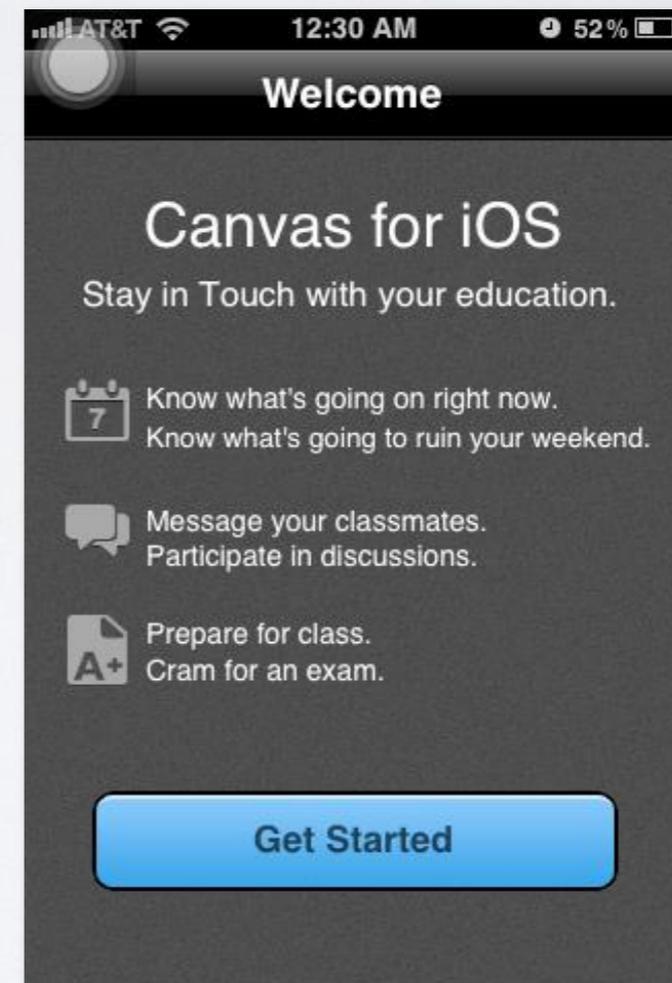
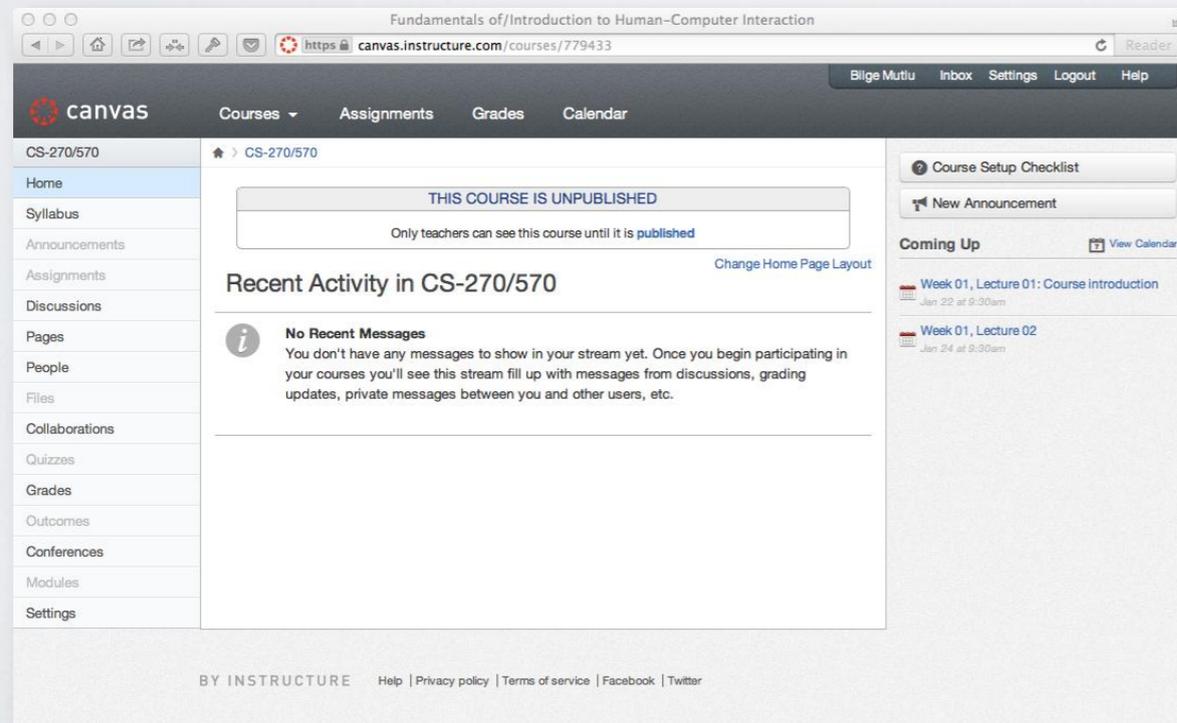
# Class Basics

Course Website: Canvas – invitation by end of day

Location: Psychology 121

Time: 9:30 - 10:45 am

Final: May 14, 5:05-7:05pm



# Learning Goals

Learning state-of-the-art HCI methods to

Understand user needs, identify problems with interfaces

Develop ideas, specify designs, prototype specifications

Evaluate prototypes

Practicing methods and processes in

Assignments

Team projects

# Ulterior Learning Goals

Learning and practicing

Efficient reading

Discussing & challenging ideas

Giving each other feedback

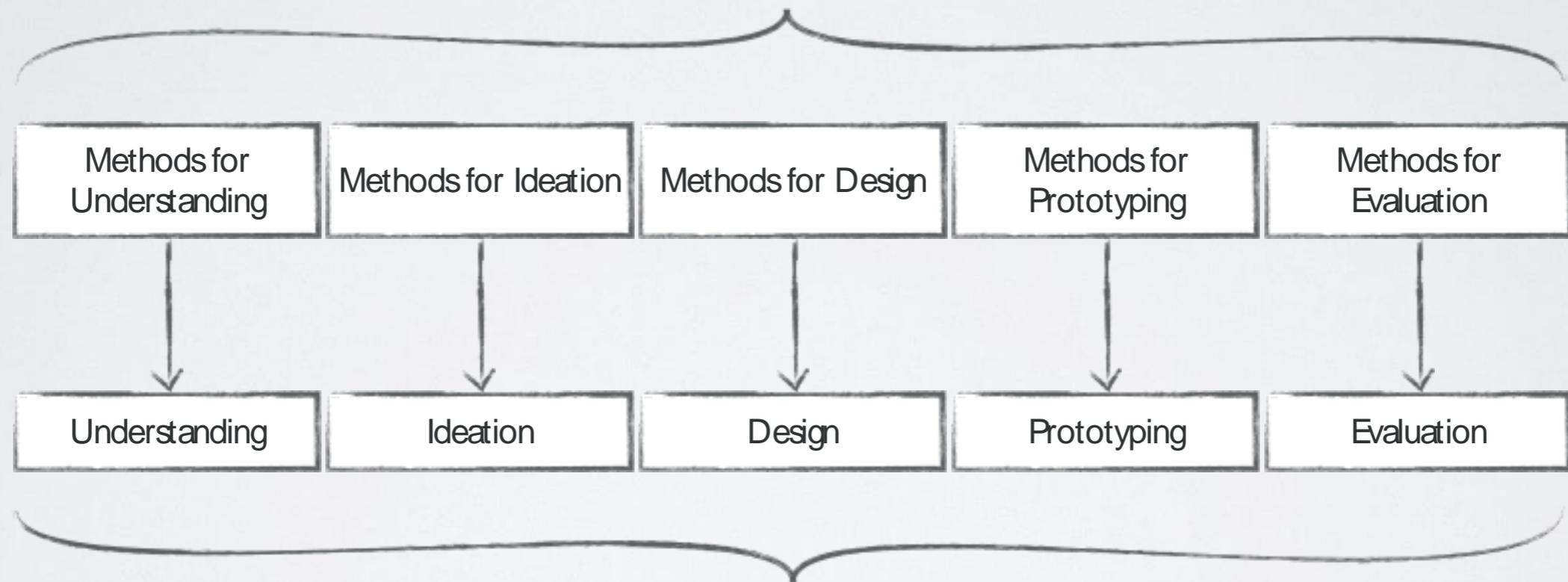
Making presentations

Working in groups

General professionalism

# Course Structure

Methods lectures + hands-on  
activities + assignments



Project Steps

# Methods Thread

Tuesday and Thursdays

Lectures with TopHat (next slide)

Weekly hands-on activities in class

Assignments — *a total of 6 over the semester*

Readings

Midterm exam

Final exam

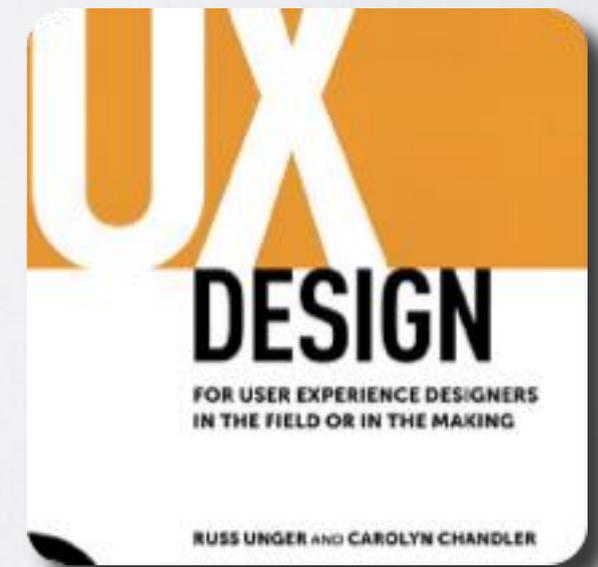
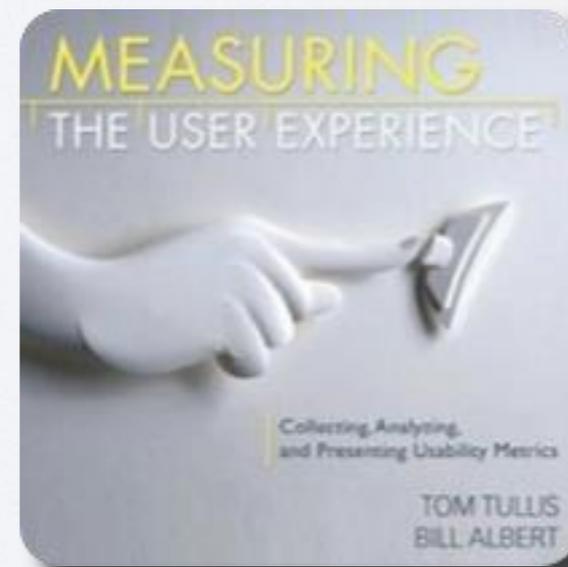
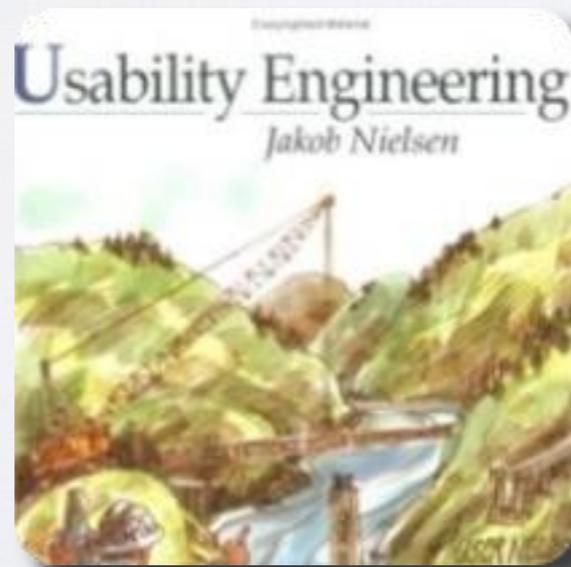
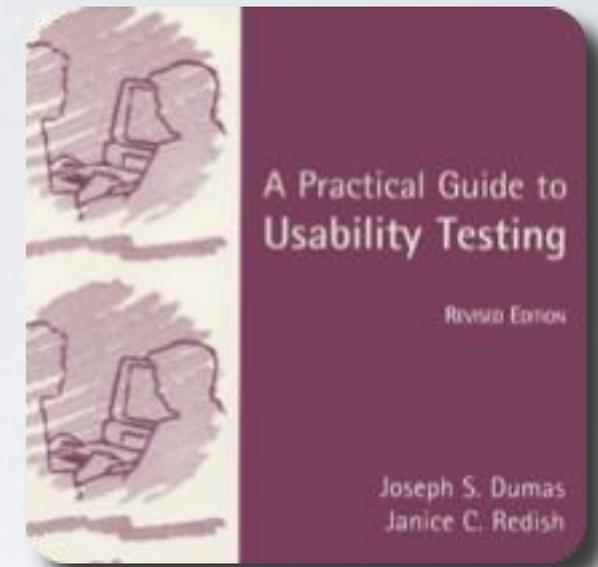
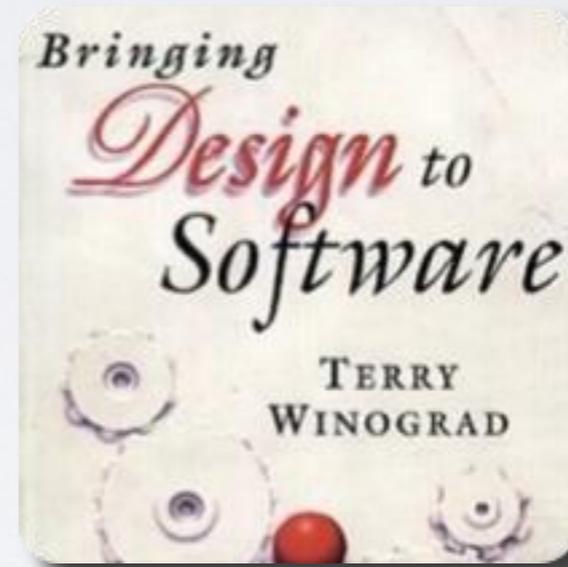
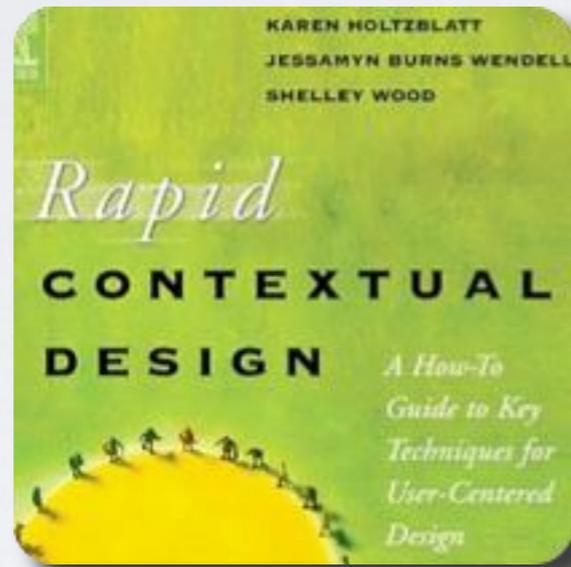
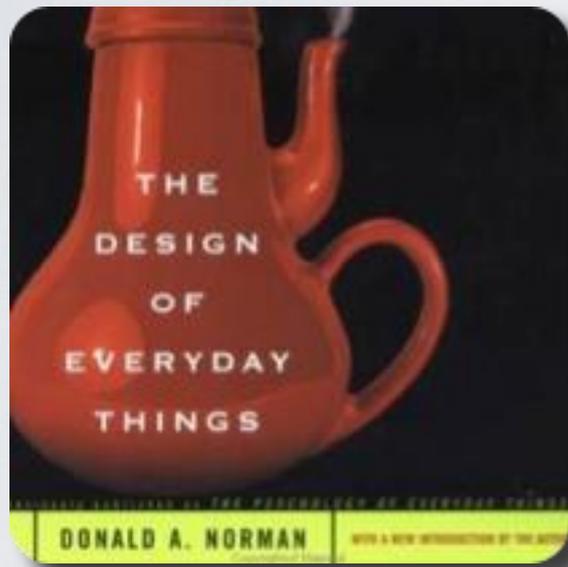
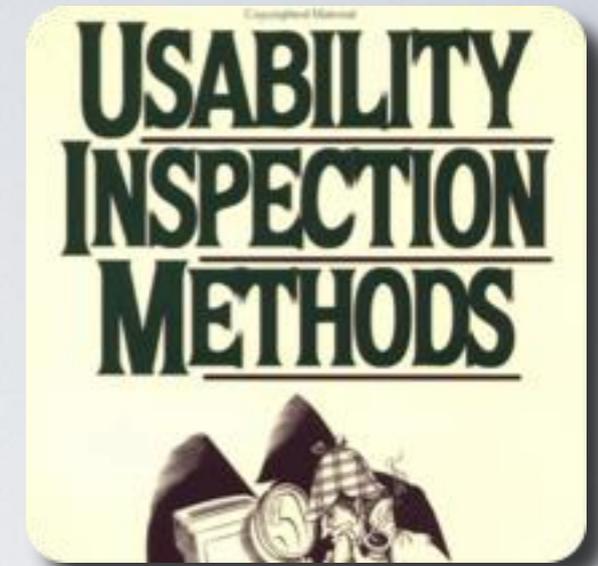
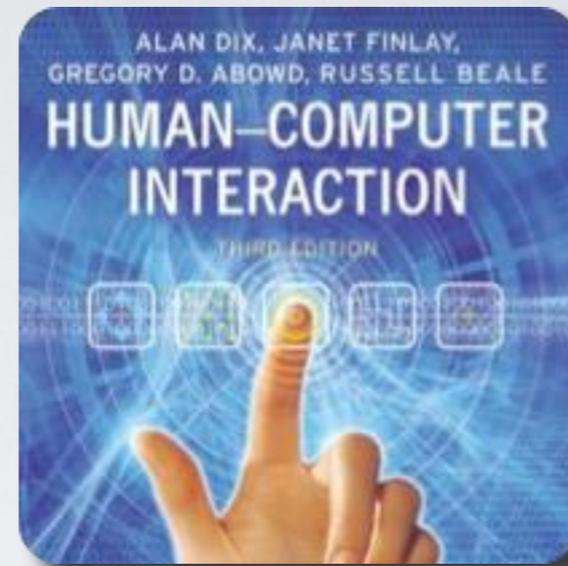
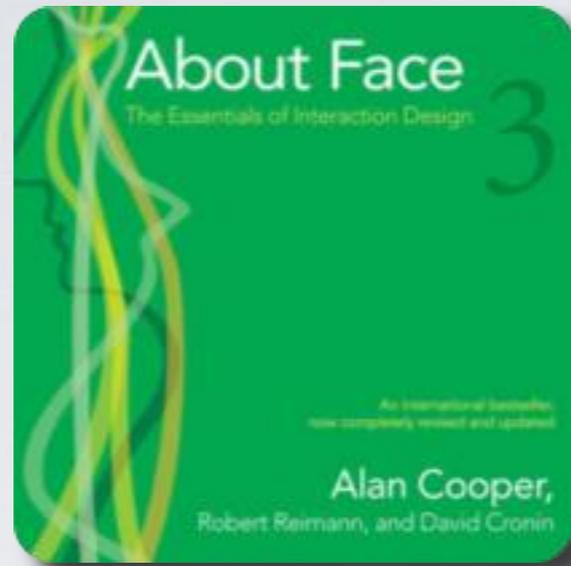
# TopHat

Instead of textbooks - \$20 for a semester

TopHat vs. in-class quizzes

Accessible via the web, smart phone, or text messaging

<https://tophat.com> – will provide time at the end of class for sign-ups



# Project Thread

**Fridays**

**Five-week-long projects**

**Teams of 3**

**Interim and final presentations**

**Deliverables: The two presentations + a processbook outlining your design process**

*More on projects next class*

# Grading

Methods assignments — 15%

Midterm exam — 15%

Final exam — 15%

Project 1 — 15%

Project 2 — 15%

Project 3 — 15%

Participation & meeting ulterior learning goals — 10%

**Team-member evaluations**

Make up 25% of project grades

Make your team members happy!

# More Nitty Gritty

## Class time

Starts at 9:30 am sharp!

## Missing class

Missing Tuesdays + Thursdays

Download lecture slides + assignment from class website

If needed, request to meet with the TA or the instructor to catch up

## Missing Fridays

Negotiate with your team members — *remember team evaluations!*

# Late Policy

## Assignments

Late assignments will lose 10% of grade for each day

## Projects

No late deliverables

# Communication via Canvas

Use Canvas for all communication

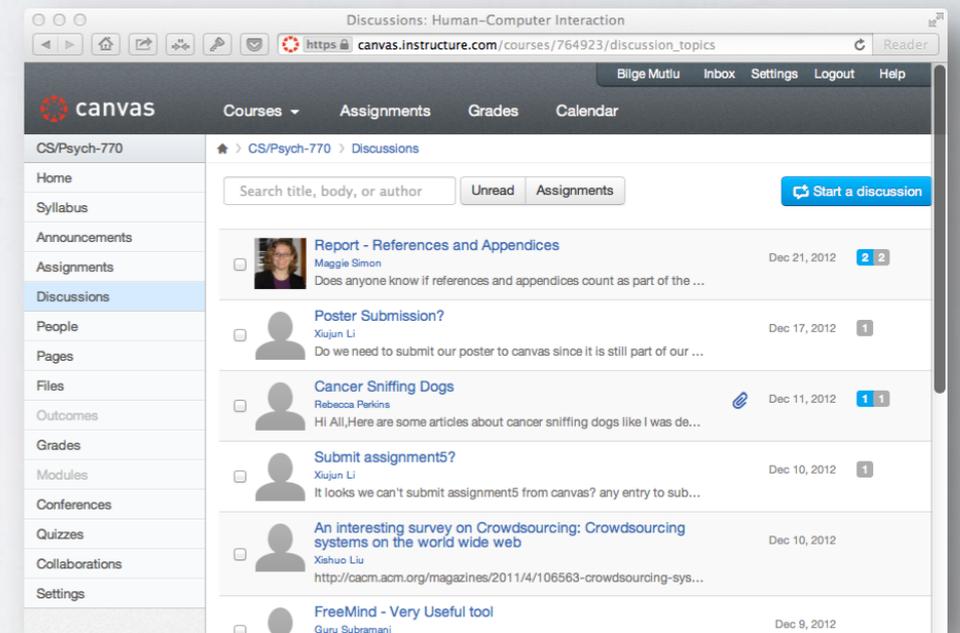
Questions regarding class materials

Use “Discussions”

Questions regarding personal issues

Use “Conversations”

Alex and I will log on everyday



# Your Feedback

Like HCI, the class is evolving

We will conduct surveys throughout the semester

**Get involved** in shaping it

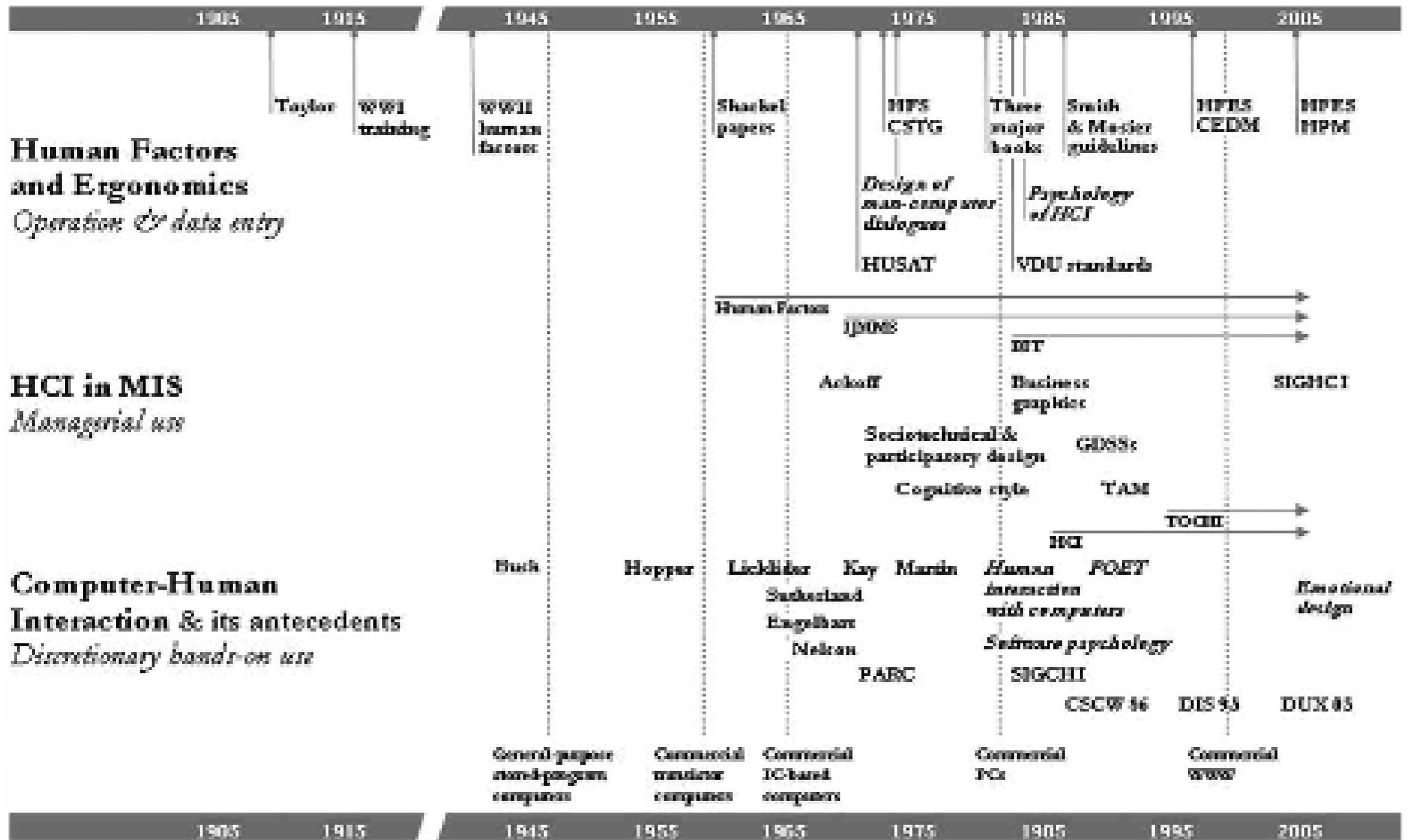
Tell me when you have new ideas, concerns, problems

**Questions?**



# A Brief History of HCI





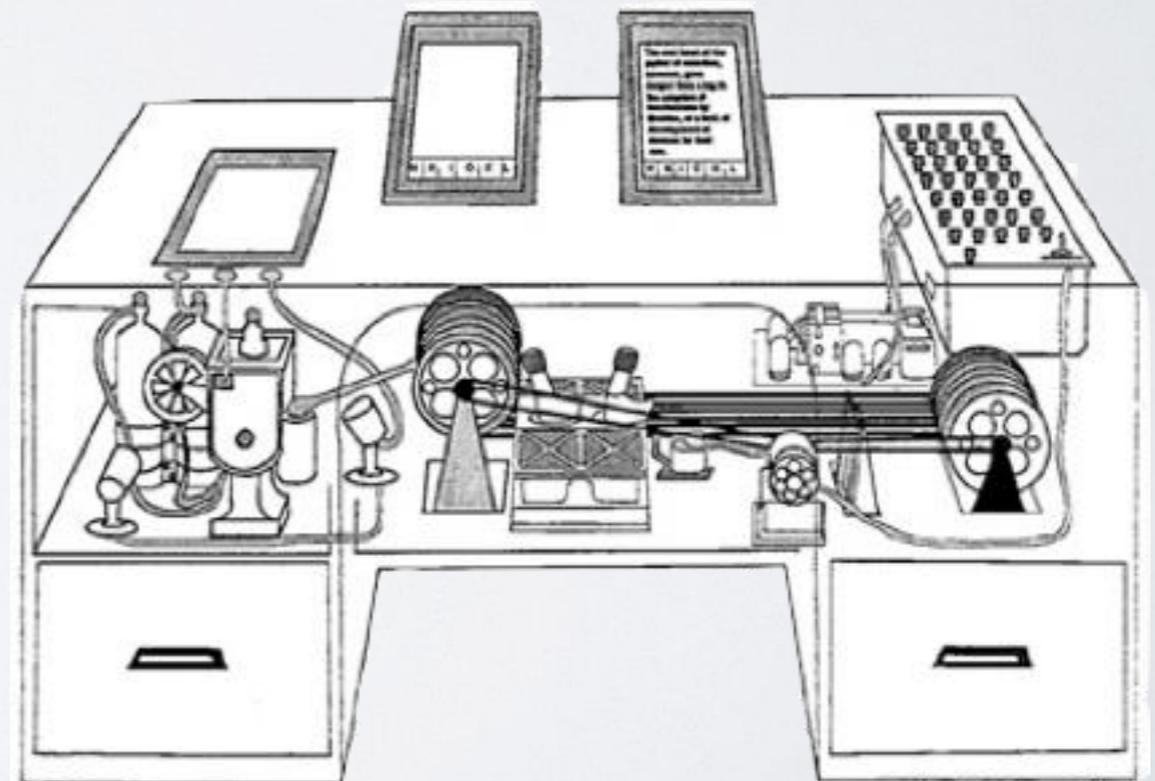
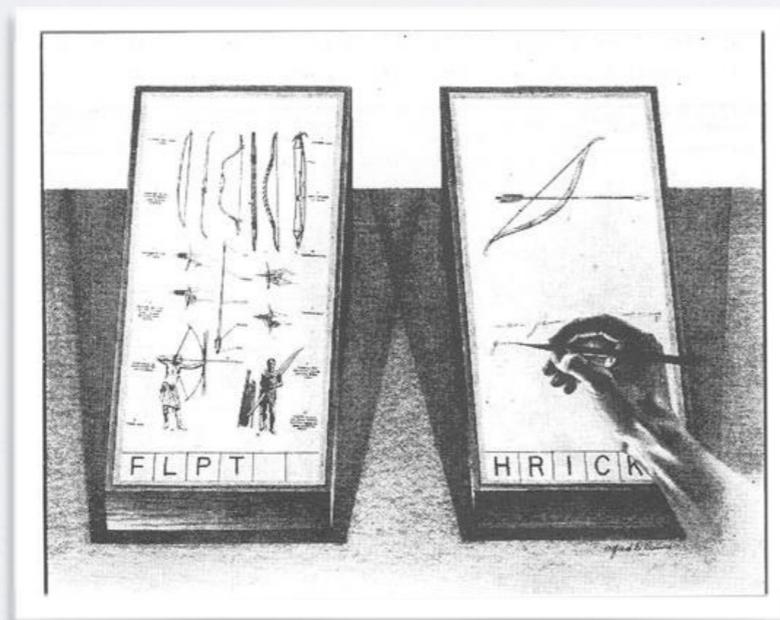
# The 40s

Memex, 1945, Vannevar Bush

Stores all records/articles/communications

Items retrieved by indexing, keywords, cross-referencing

Information linked through associative trails



# The 60s

## SketchPad, 1963

Ivan Sutherland's PhD thesis at MIT: "Sketchpad: A Man-machine Graphical Communications System"

Hierarchy

Object-oriented graphics

Constraints

Icons

Copying

Light pen as input device

Recursive operations





# The 60s

The Mouse, 1968

Douglas Engelbart, Stanford Research Institute (SRI)

[“Mother of all demos”](#)

Hierarchical hypertext

Multimedia

Windows

Shared files

Electronic messaging

Video conferencing

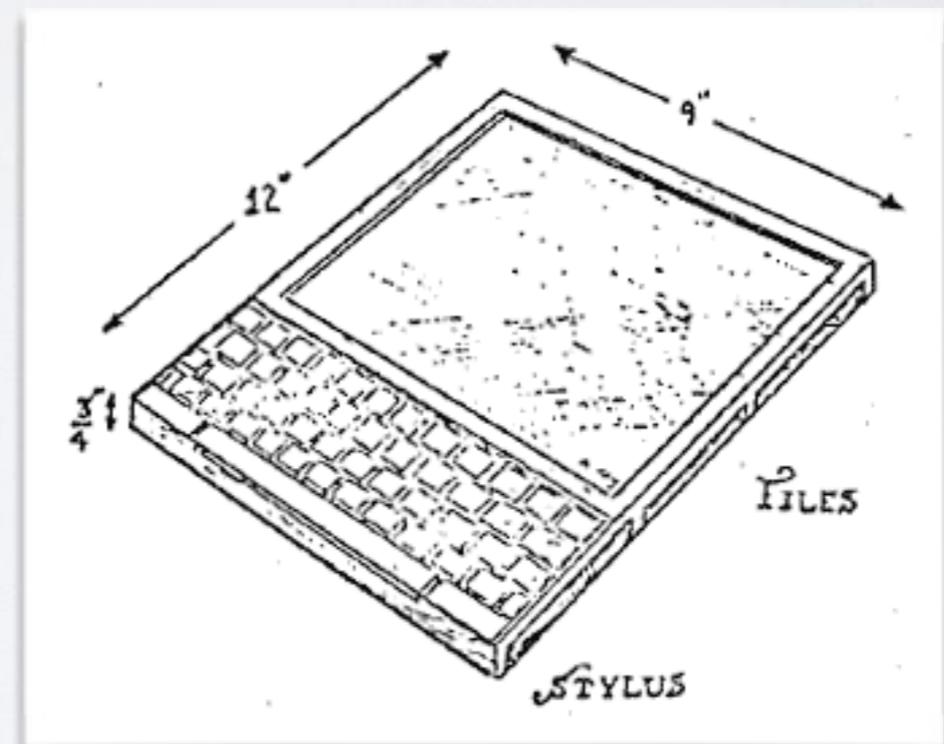
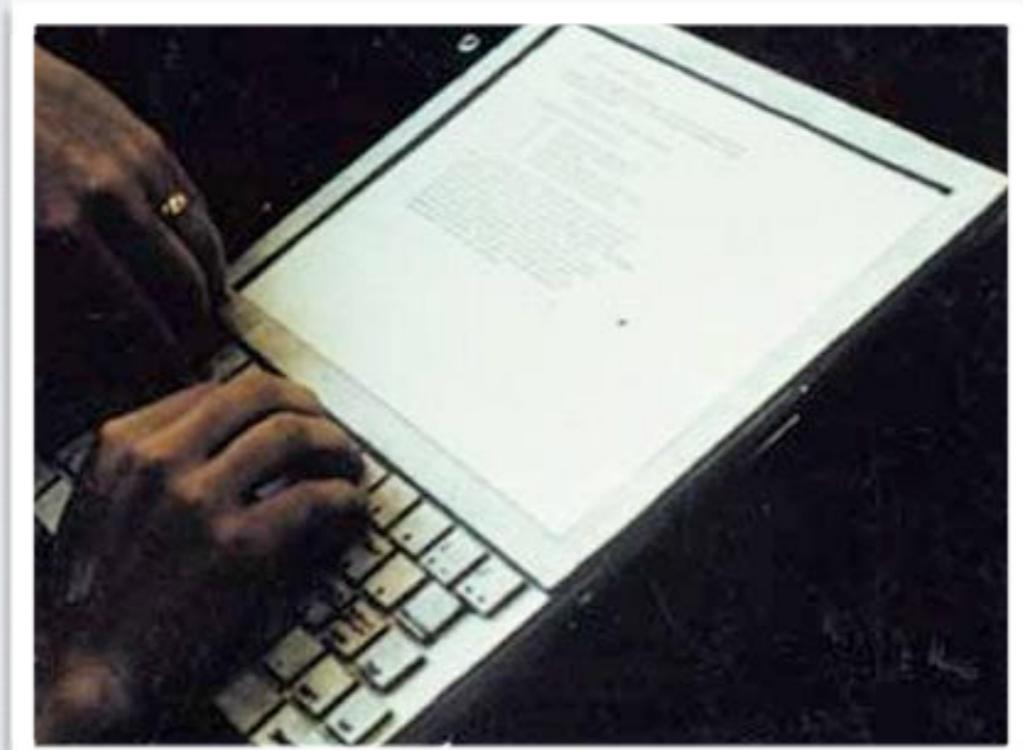


# The 60s

Dynabook, 1968, Alan Kay (Xerox PARC)

Personal computer

Desktop interface



# The 70s

Xerox Alto, 1973, Xerox PARC

First computer with

The desktop metaphor

GUI

Ethernet



# The 70s

Apple II, 1977, Apple

First mass production

Color graphics



# The 80s

Xerox Star, 1981, Xerox PARC

First desktop computer to integrate

Bitmapped display

GUI

Icons

Folders

Mouse

Ethernet

File & print servers

Email



# The 80s



## [The Knowledge Navigator](#), 1987

Apple ATG - Hugh Dubberly

Speech interfaces

Virtual agents

# Some History – 90s

Ubiquitous Computing, 1991

Mark Weiser (Xerox PARC)

[The Computer for the 21st Century](#)

“The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it.”

# Some History – 90s

Apple Newton, 1992





Intelligence by Newton

# The 90s

1990s AT&T “You Will” Ads







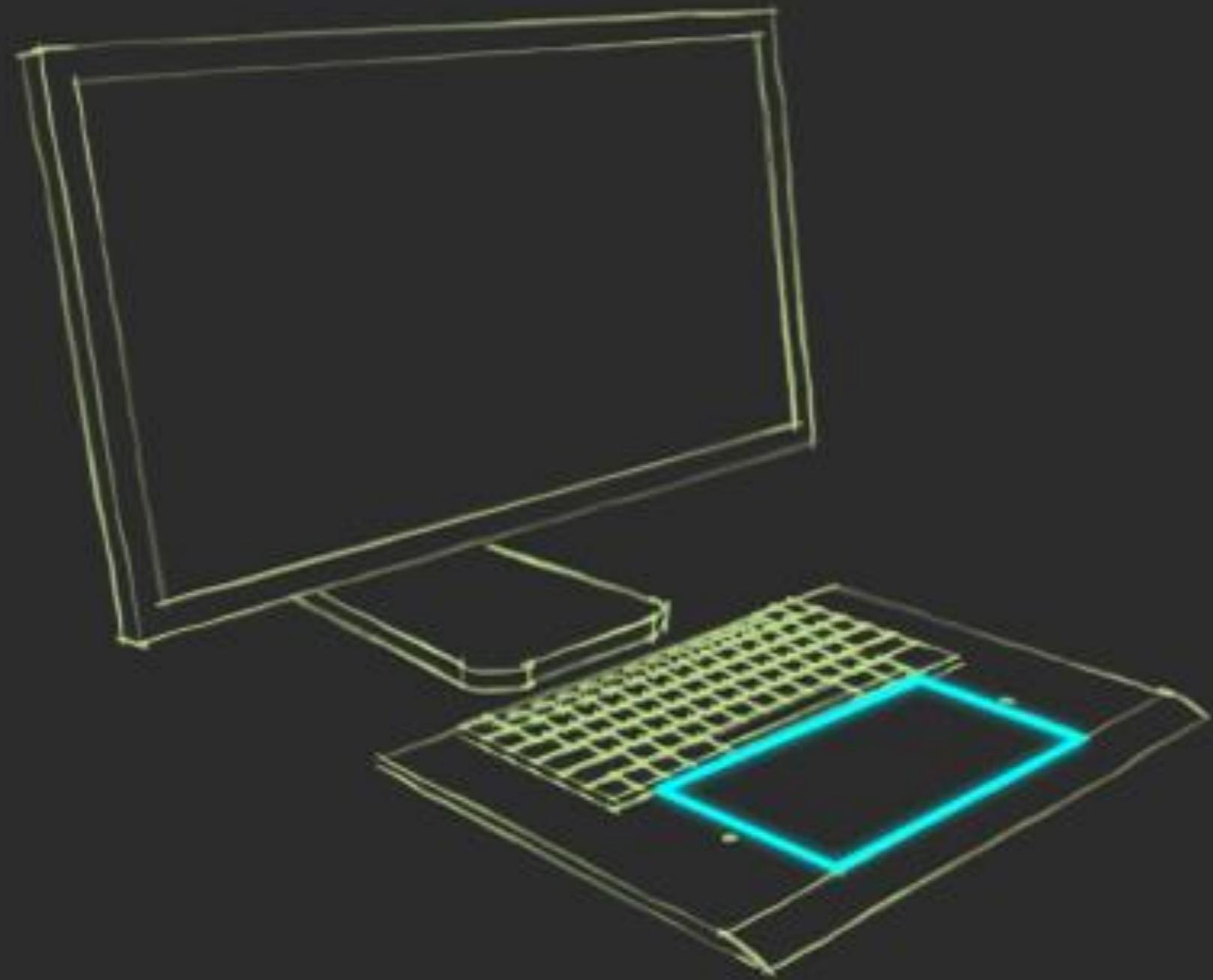






**Which of these  
technologies were  
realized?**

# Tomorrow's technology





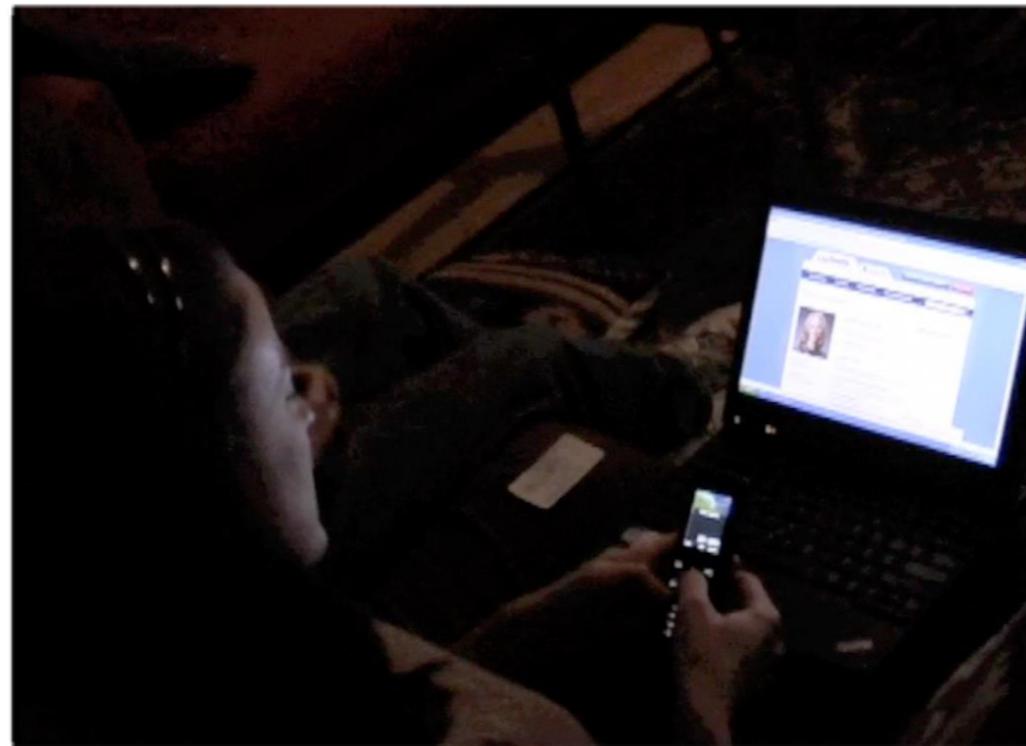
***Microsoft***



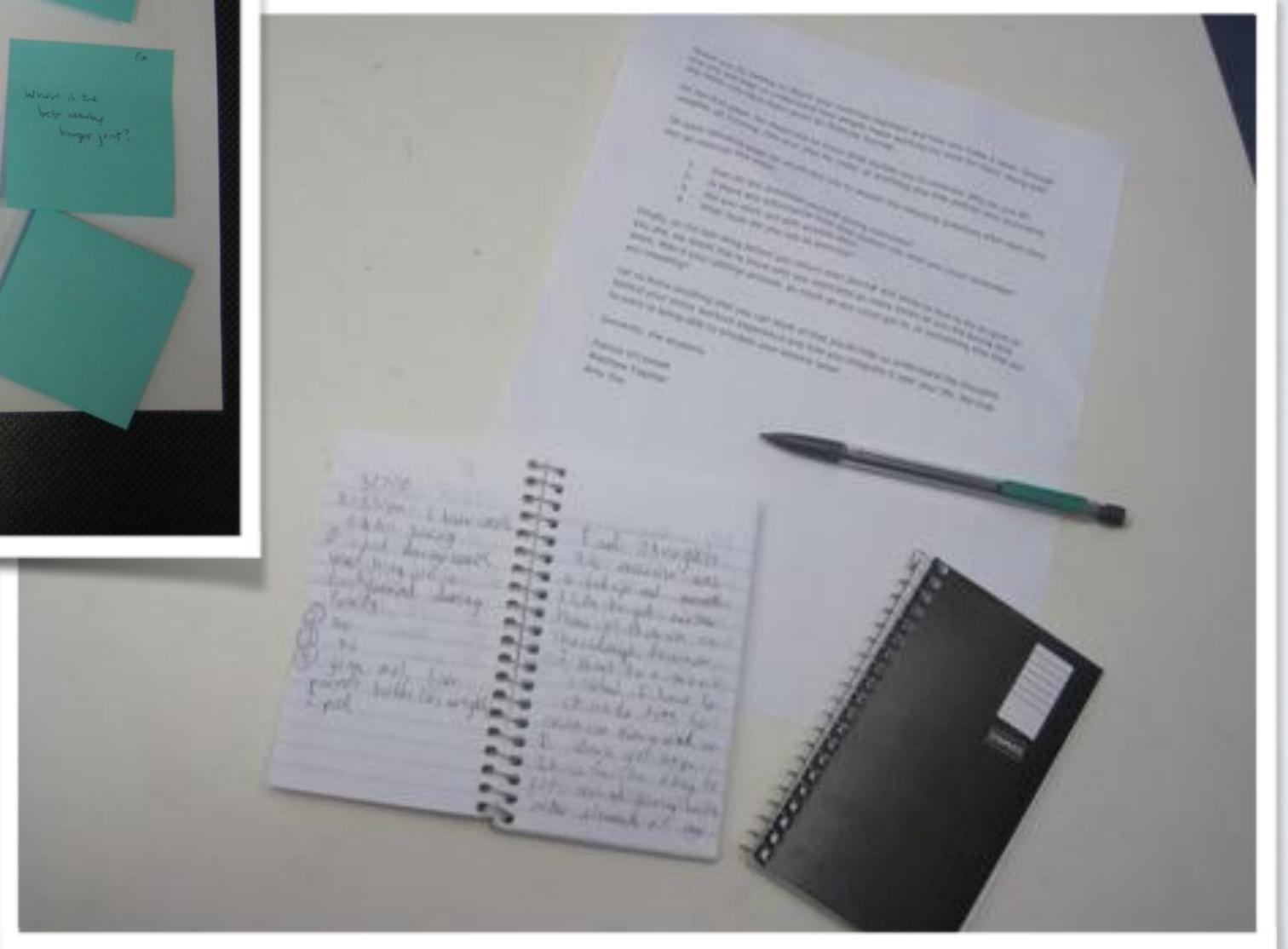
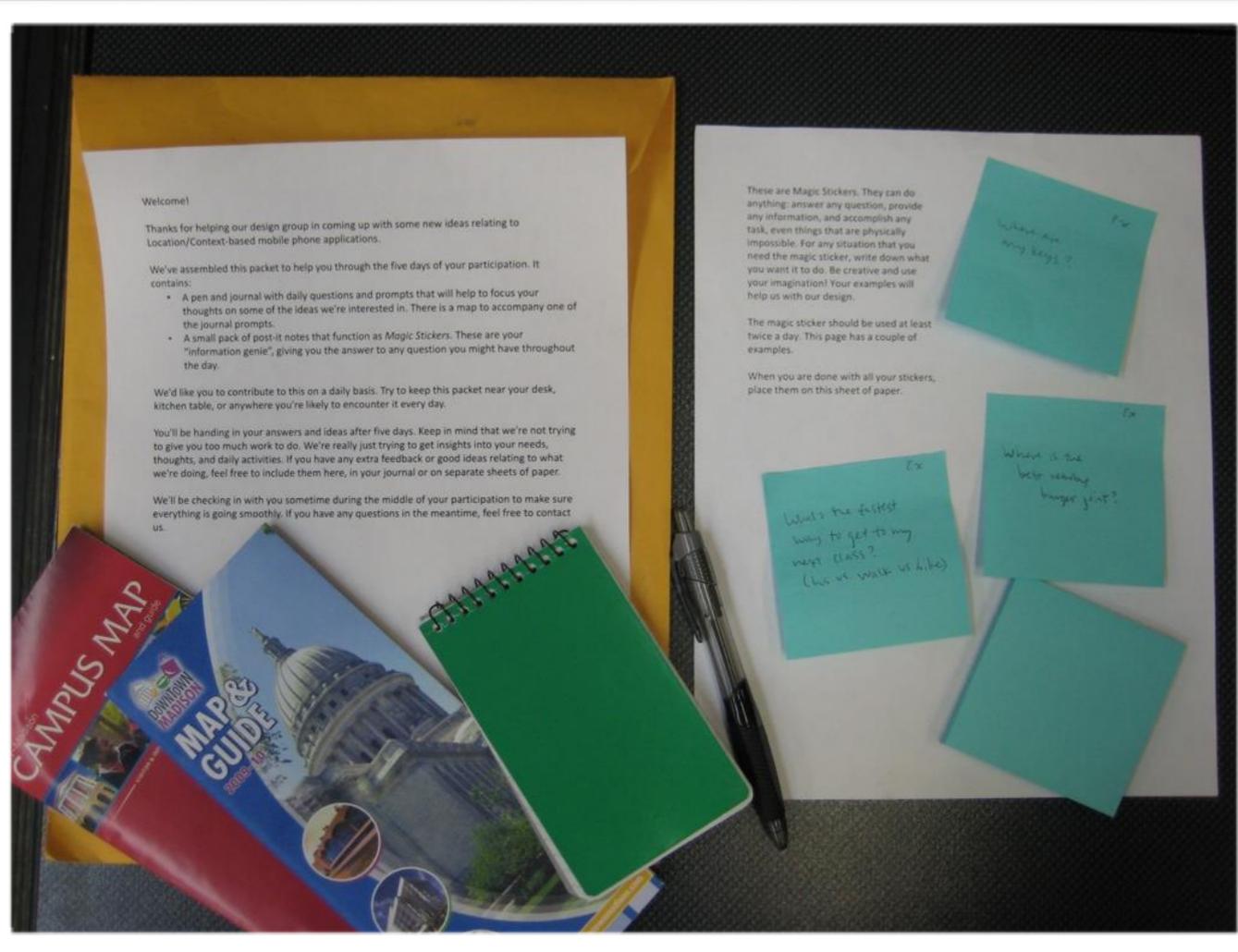
ONLINE NEWS NETWORK

**So, what will we do in  
this class?**

# Understanding User Needs



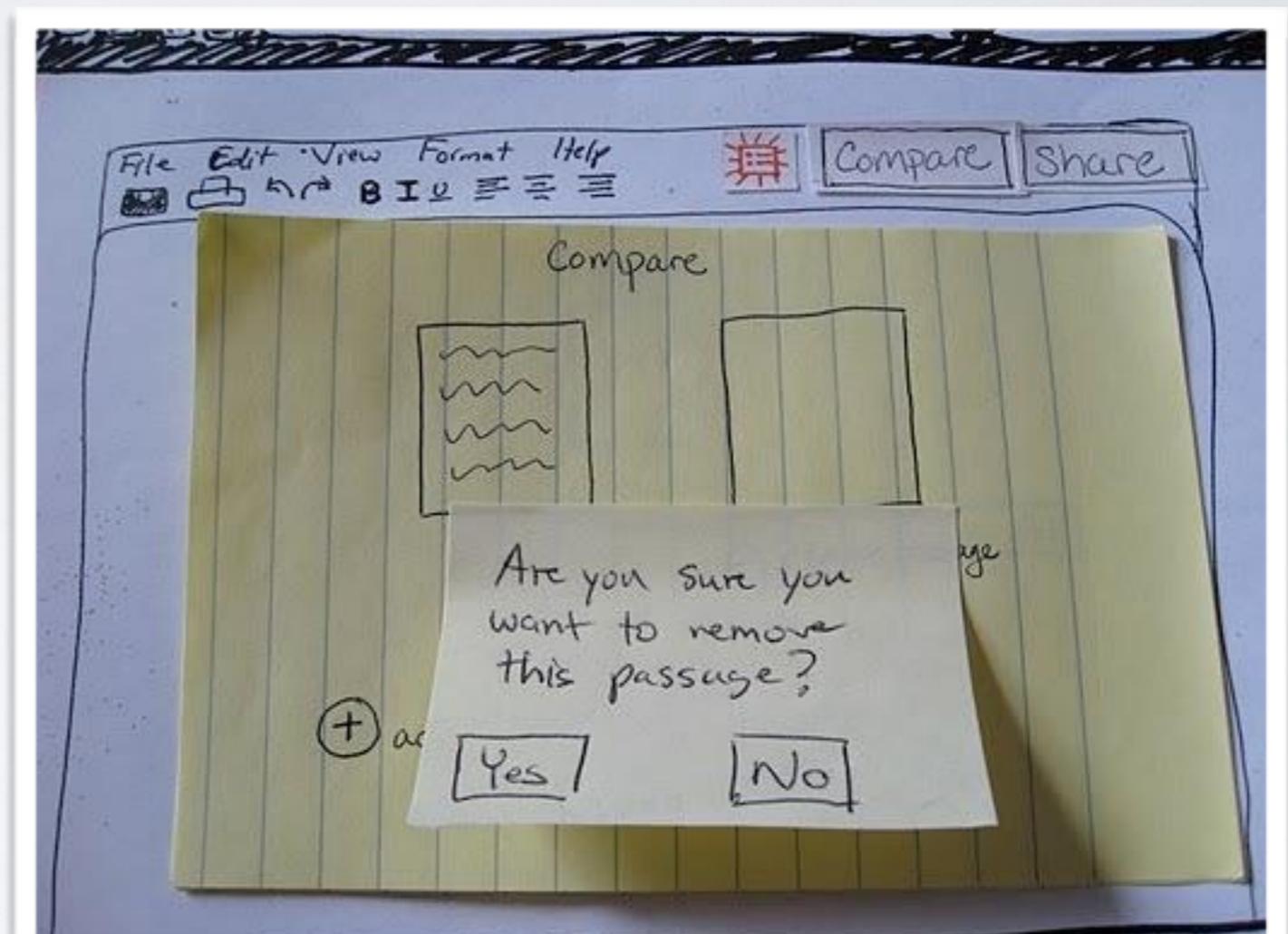
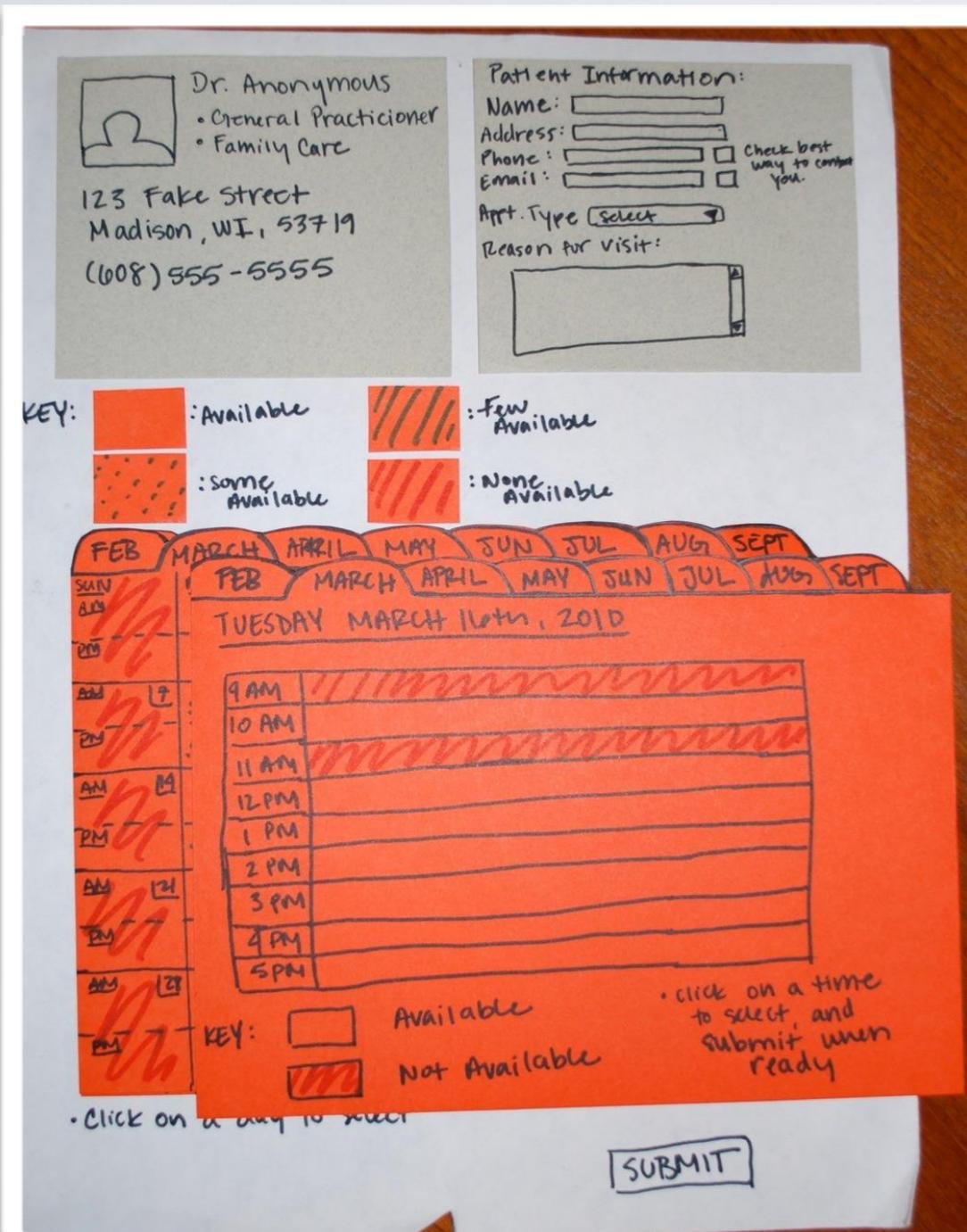
# Understanding User Needs



# Ideation & Design



# Ideation & Design



# Implementation & Evaluation

**Student Name**  
 Program: Computer Science  
 Adviser: Rebecca Hasti  
 Semester: Spring 2010

**Chosen Classes**

CS352	Required Classes (Take All)
CS577	
CS520	✓ CS240 Introduction to Discrete Mathematics 3 cr.

Legend:   Already Taken   Available   Prerequisites Not Met   Not Offered

**L. Stanley Brysh, DMD, FAAHD, DABSCD**  
 Chair, Department of Dentistry  
 Director, Max W. Poble Dental Clinic  
 Director, General Practice Residency  
 (608) 417-8500  
 lbrysh@meriter.com

February 2010

Click on an appointment time below to schedule a visit.  
 Mouse over unavailable times to see next available slot.

Feb 22, 2010 - Feb. 25, 2010

	Sun 2/21	Mon 2/22	Tue 2/23	Wed 2/24	Thu 2/25	Fri 2/26	Sat 2/27
8 AM		Click here to schedule	Click here to schedule	unavailable	Click here to schedule	unavailable	
9 AM		unavailable	Click here to schedule	Click here to schedule	Click here to schedule	Click here to schedule	
10 AM		Click here to schedule	Click here to schedule	unavailable	Click here to schedule	unavailable	
11 AM		Click here to schedule	unavailable	unavailable	unavailable	unavailable	
12 AM		unavailable	unavailable	This time slot is next available: Mar. 4	unavailable	unavailable	
1 PM		unavailable	unavailable	unavailable	unavailable	Click here to schedule	
2 PM		unavailable	Click here to schedule	Click here to schedule	unavailable	Click here to schedule	
3 PM		unavailable	unavailable	unavailable	unavailable	unavailable	
4 PM		unavailable	unavailable	unavailable	unavailable	unavailable	
5 PM		unavailable	unavailable	unavailable	unavailable	unavailable	
6 PM		unavailable	unavailable	unavailable	unavailable	unavailable	

Show all next available slots.

concepts of logic, sets, partial order and other relations, and functions. Fundamental principles of counting. Basic algebraic structures: modular arithmetic, group, ring, and field structures. Boolean algebra. Introduction to graph theory: trees, depth first search, matching, max-flow min-cut, and other optimization algorithms. Applications. Prereq: Math 221.

**Basic Systems** Remove

components, Boolean algebra, combinational logic analysis and synthesis, synchronous and asynchronous sequential logic analysis and design, digital systems, computer organization and design. Prereq: CS 252 or equivalent. Open to students with EGR classification.

**Methods** Add

**Remove**

**Remove**

**Remove**

**Remove**

**Add**

**Remove**

**Add**

**Remove**

New Chat My Chats Public

LUNCH

PRIVATE Create

- ✓ Matt Benes
- Ben Taylor
- Hunter King
- ✓ Amy Berg
- Heather Stanton
- Jon Markman
- Conor Ward

Carrier 1:40 PM

## Bench

12 reps 3 sets  
 70 lb 1 min rest

Repetitions	Set
9	3
Weight	Rest Time
70 lb	1:00

Workout Exercises Stats Settings

# Implementation & Evaluation

Script: CogTool\_rev2-ChengPunzelAmbroziak > Breadcrumbs\_rev2 > View route & turn off route tracking

home2

Prediction: 13.741 s Show Visualization

**Script Step List**

Frame	Action	Widget/Device
home2	Think for 1.200 s	
home2	Move and Tap	route
route2	Think for 1.200 s	
route2	Move and Tap	route_pin_b
brats2	Think for 1.200 s	
brats2	Move and Tap	next_poi
chazen2	Think for 1.200 s	
chazen2	Move and Tap	back2map
route2	Think for 1.200 s	
route2	Move and Tap	home
home2	Think for 1.200 s	
home2	Move and Tap	settings
settings_on2	Think for 1.200 s	
settings_on2	Move and Tap	rt_switch
settings_off2	Think for 1.200 s	
settings_off2	Move and Tap	home_btn
home2		

**Route**  
Track where you go and what you do throughout the day.

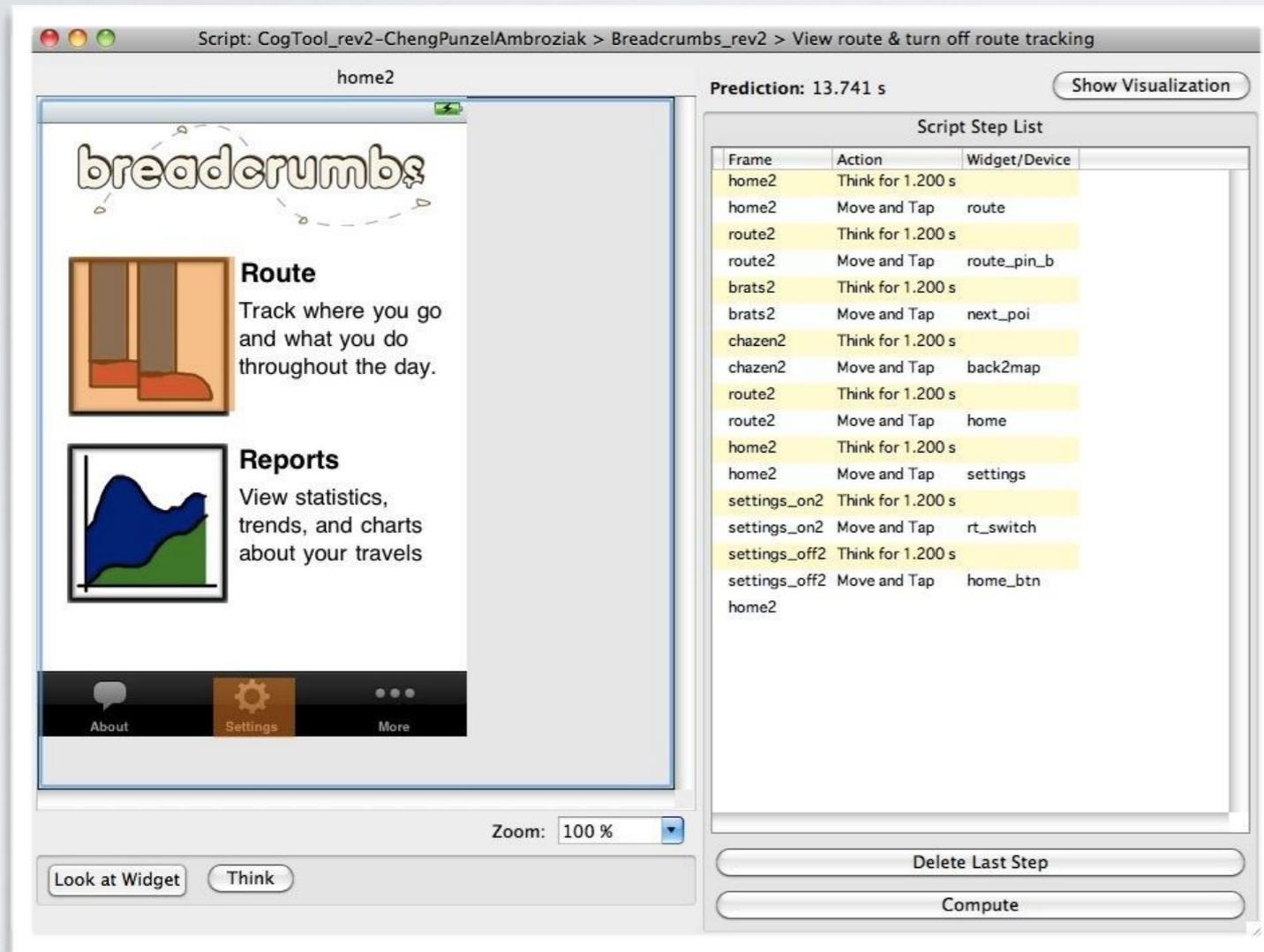
**Reports**  
View statistics, trends, and charts about your travels

Zoom: 100 %

Look at Widget Think

Delete Last Step

Compute



Design: Untitled Project 1 > Design 1 - CogTool

File Edit Create Modify Window Help

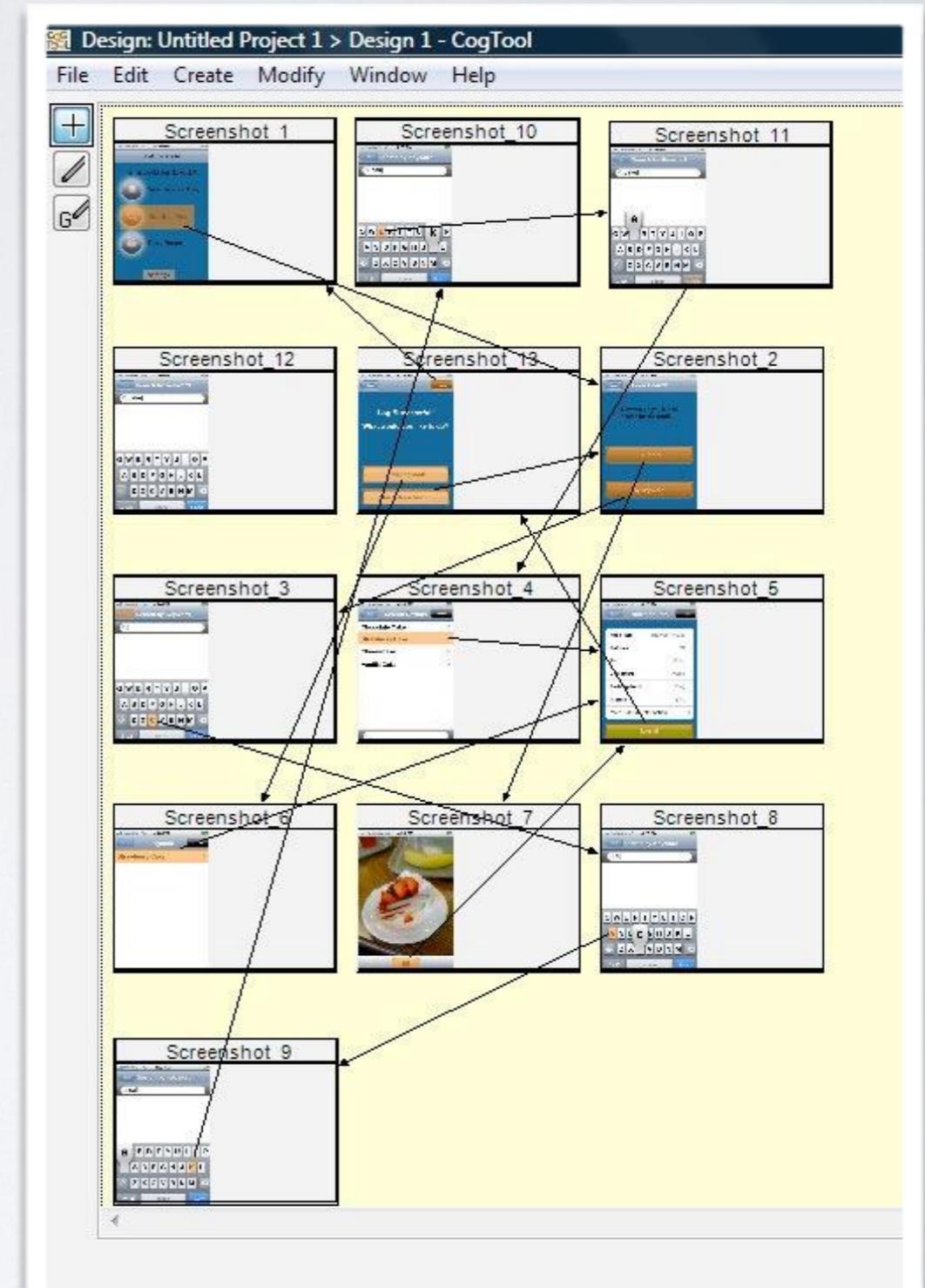
Screenshot 1 Screenshot 10 Screenshot 11

Screenshot 12 Screenshot 13 Screenshot 2

Screenshot 3 Screenshot 4 Screenshot 5

Screenshot 6 Screenshot 7 Screenshot 8

Screenshot 9



# Next

**Thursday — Introduction continued & Design 101**

**Friday — Project teams formed**

**If you are still in class by Friday, we will assume that you are taking it.**

# Thanks!

Irene Rae  
Computer Sciences  
University of Wisconsin–Madison

CS-570 Introduction to Human-Computer Interaction



# TopHat

