Human-Computer Interaction Design Studio

Terry Winograd and Bill Verplank
TAs: Kevin Collins & Marcello Bastea-Forte

08 January 2008

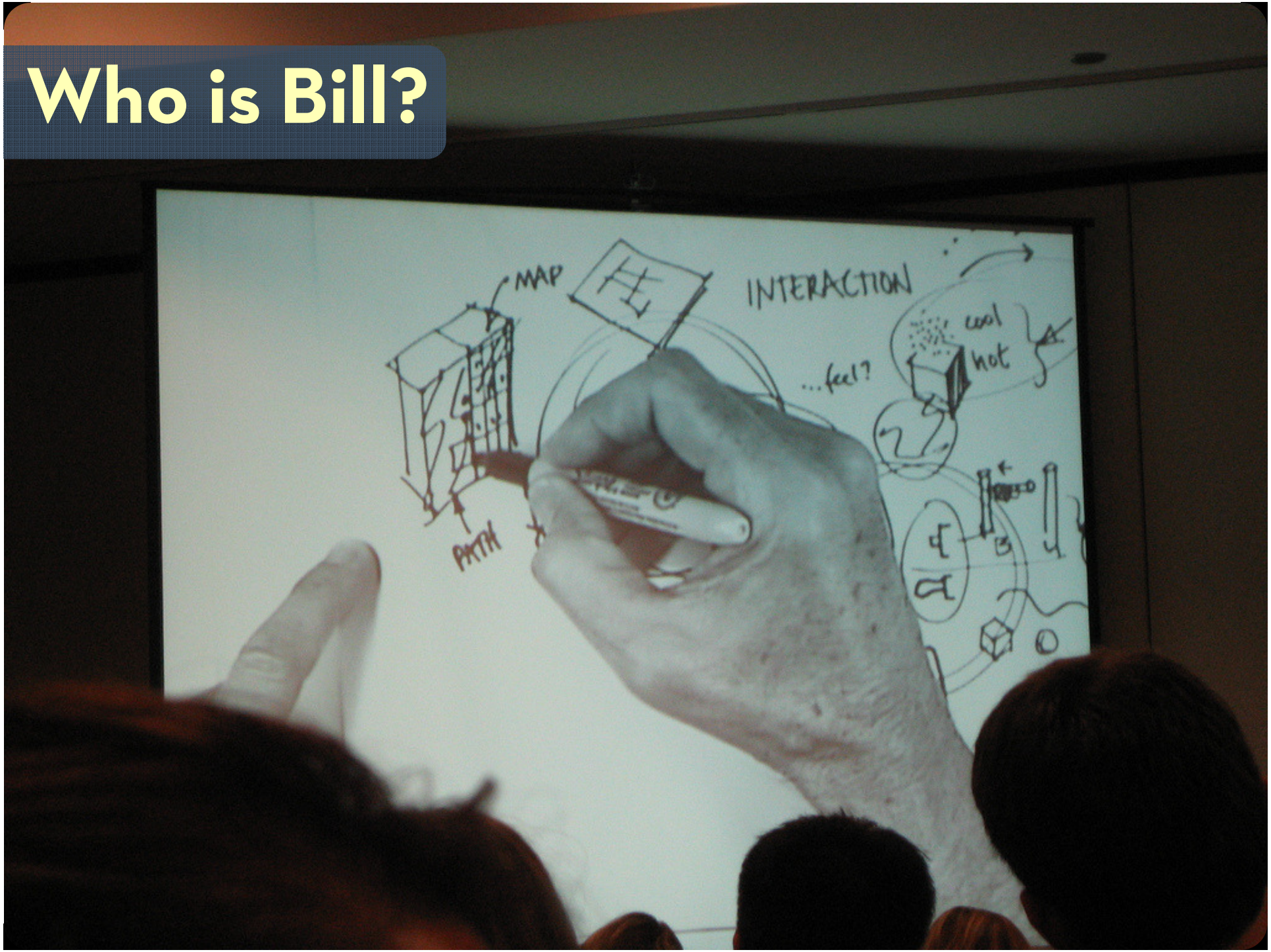
http://cs247.stanford.edu

Today

- **Teaching staff & student introductions**
- Course content
- Lab section
- Course administrivia

Who is Terry?

Who is Bill?



How ‘bout Kevin?

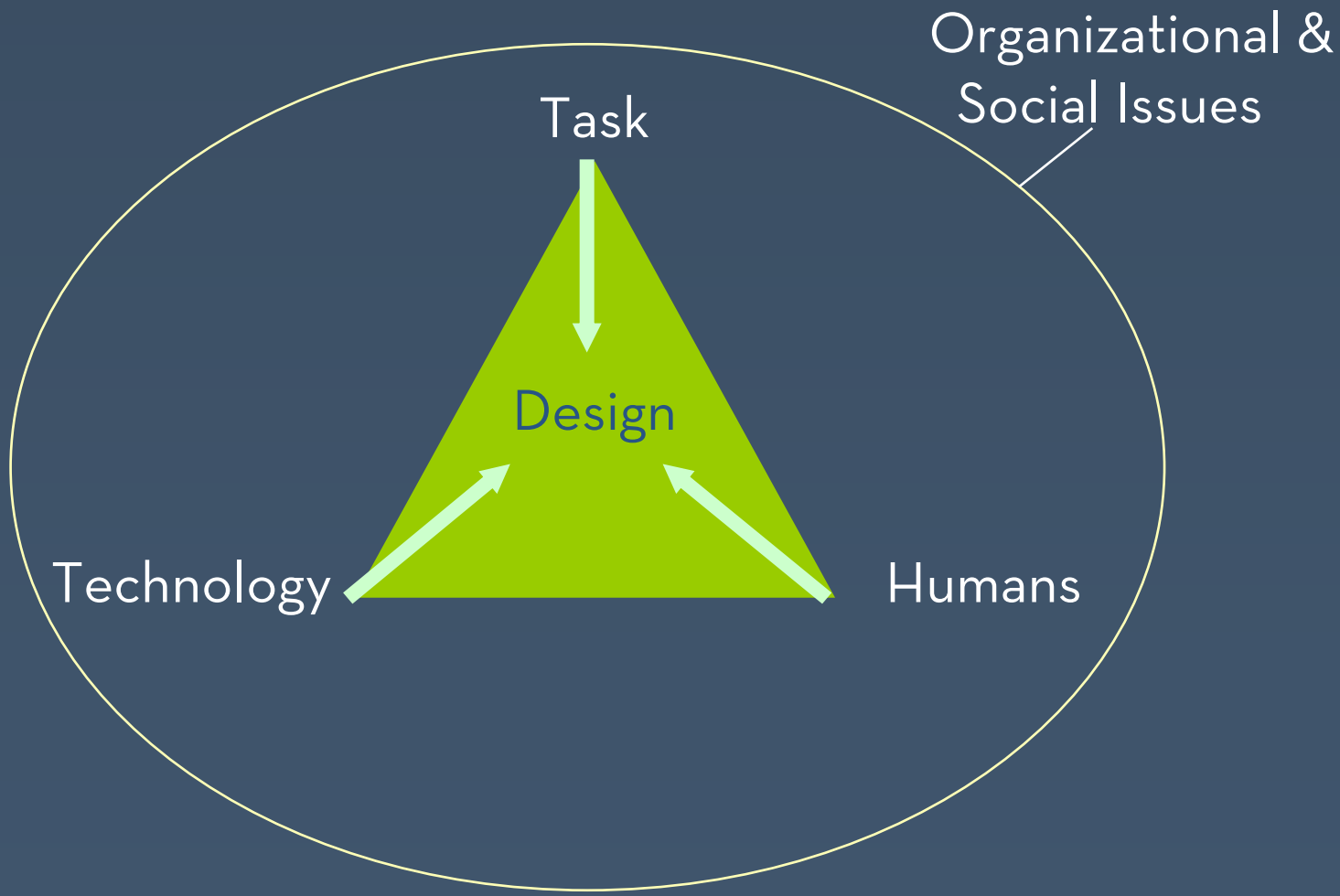

...and Marcello?

...and you

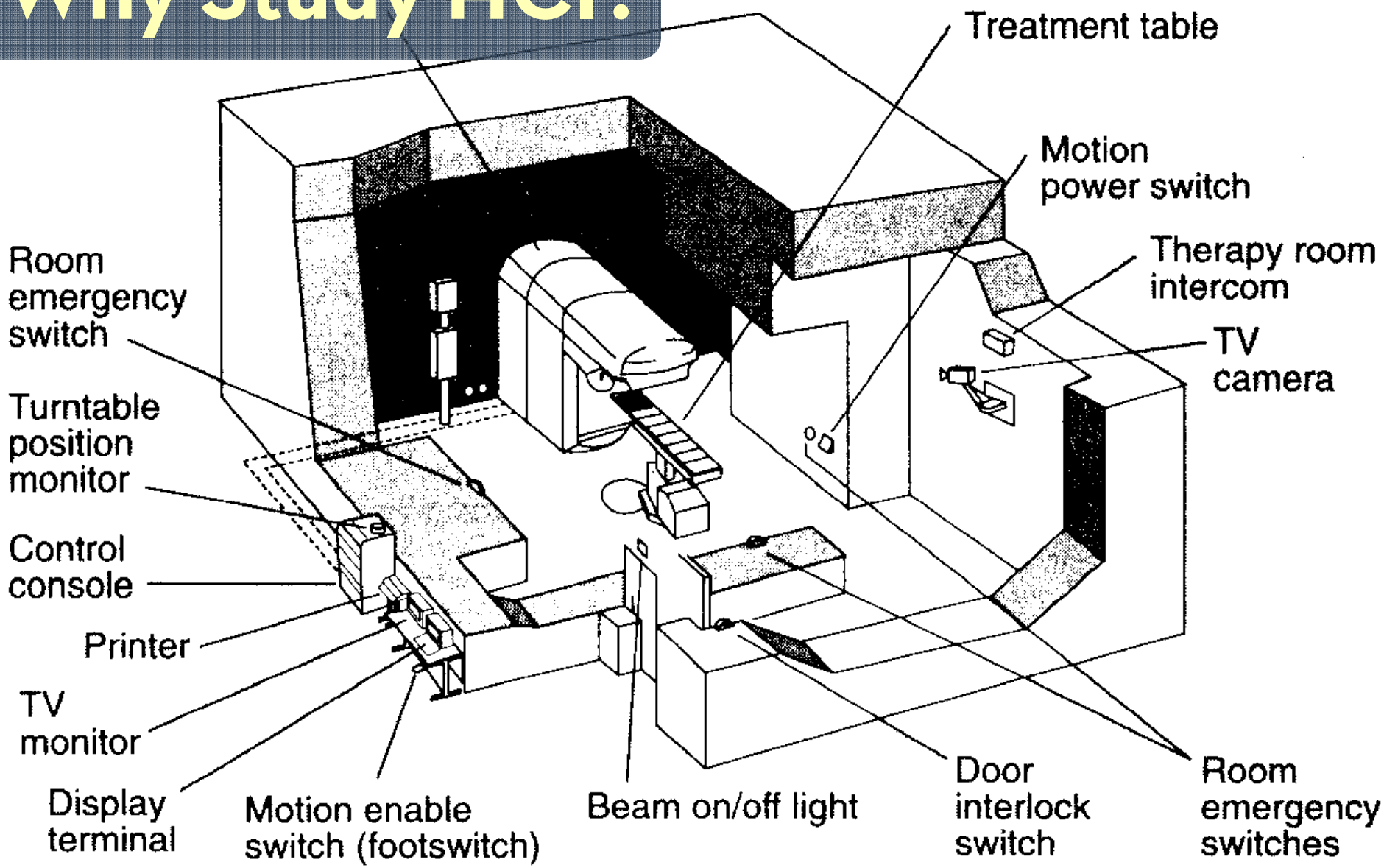
Today

- Teaching staff & student introductions
- **Course content**
- Lab section
- Course administrivia

What is HCI?


Organizational &
Social Issues
Task
Design
Technology
Humans

Why Study HCI?



Why Study HCI?


WINDOWS MOBILE

chumby™

LOG IN

HOME | STORE | MY CHUMBY | WIDGETS | COMMUNITY | DEVELOPERS | ACCOUNT | HELP

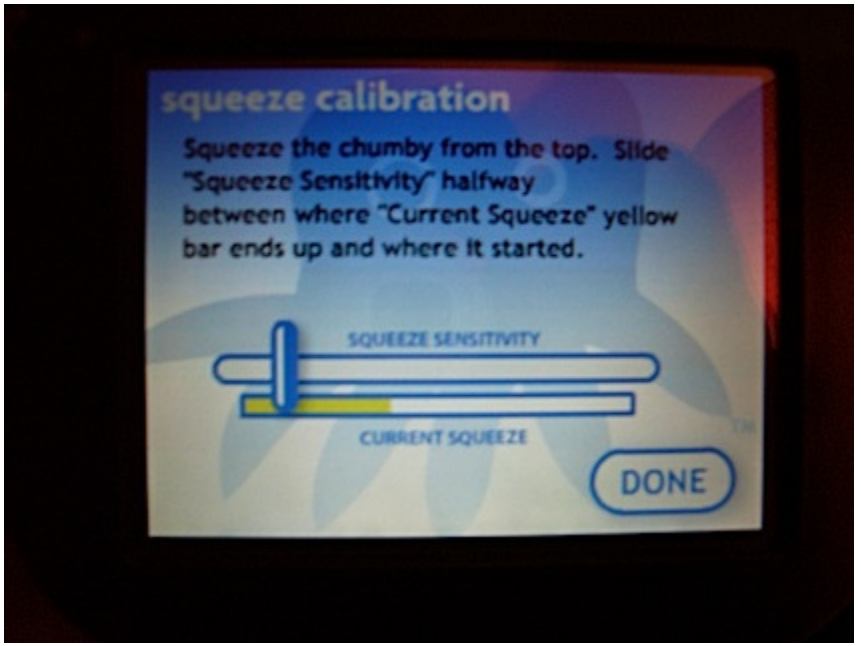
Your personal internet player. There's always something good on.

Why grab a chumby?

get the whole story

- free Chumby Network
  - personalized news
  - photo viewer
  - e-greetings
  - local weather
  - email monitor
  - auctions/classifieds
  - animations
  - games
- alarm clock
- iPod® player/recharger
- widget sharing
- over-the-air updates
- hackable

chumby classic colors: basic black | pearl | latte


squeeze calibration
Squeeze the chumby from the top. Slide "Squeeze Sensitivity" halfway between where "Current Squeeze" yellow bar ends up and where it started.
SQUEEZE SENSITIVITY
CURRENT SQUEEZE
DONE

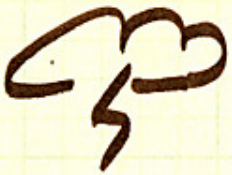
observe

invent

analyse

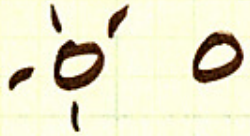
present

IDEA



METAPHOR

MODEL

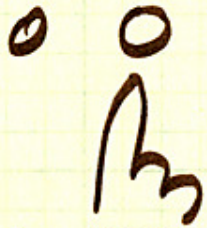


DISPLAY

ERROR

SCENARIO

TASK



CONTROL

motivation

meaning

modes

mappings

P1

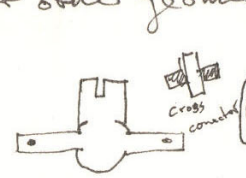
P2

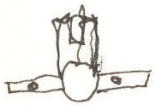
P3

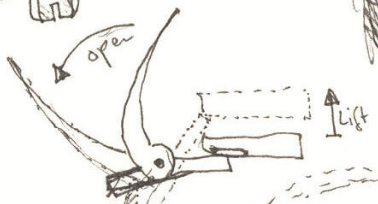
P4

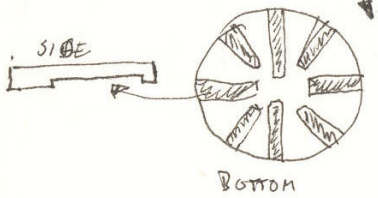

Webster
Webster
視聴率 (TV) rating
しちょうりつ

Origami? → see Stanford P.D. professor or other geometric designs

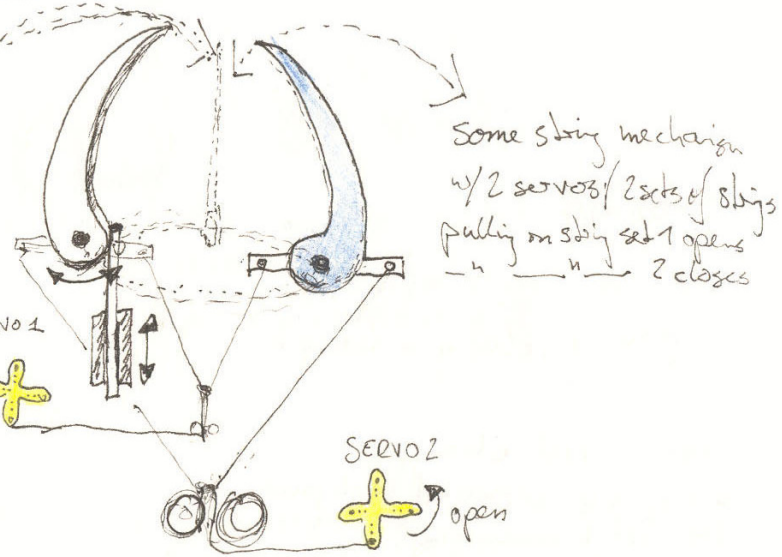




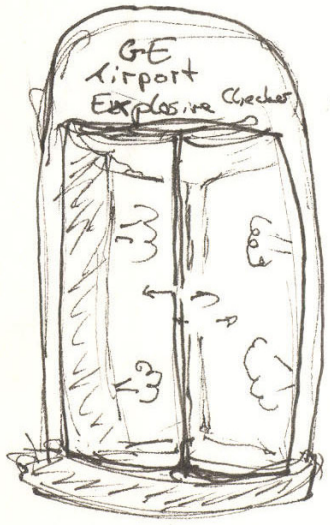


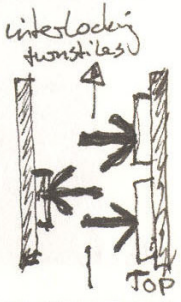


crown/claw



Some string mechanism w/ 2 servos / 2 sets of strings
pulling on string set 1 opens
" " 2 closes





turnstiles

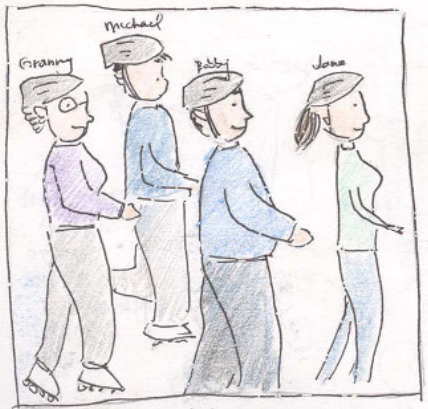
Alan's idea: attach the wires to the middle tubing

Bill: copyright visualization of li

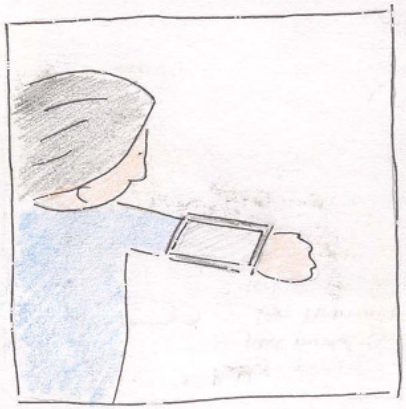
passive gate array

Scott: a gate that sh
who walked through it lo

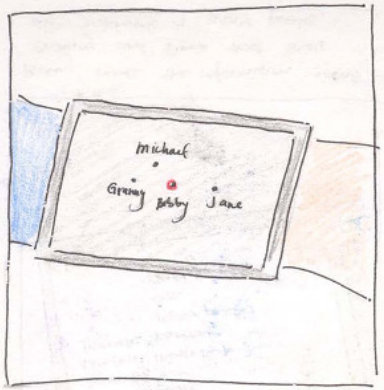
Bill: a gate that meas
ceremonial gates



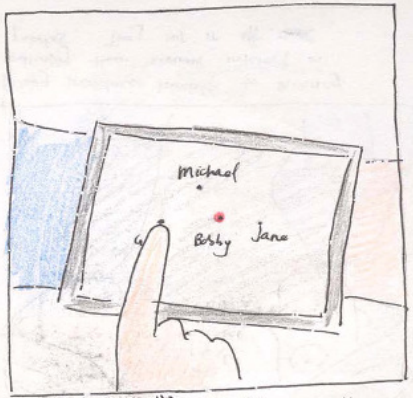
Bobby is interested in meeting new people. He wants to learn more about the people around him, but he's shy.



Bobby, as well as everyone else in the group, is equipped with a wristband which broadcasts his location and can be used to look up information on nearby people.



Bobby looks at his community info tool and sees the people around him represented on it



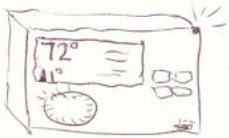
Bobby browses the information on the other people that they've chosen to

SMART THERMOSTAT
Target SCENARIO

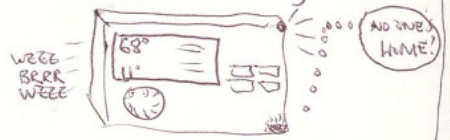
① Jen is a busy bee — it's a cold winter in her NYC studio Apt. & she doesn't want to have to worry about turning off/on her thermostat every time she leaves the apt.

② Jen has to run off to work in the morning... she doesn't even have time for breakfast!

③ Luckily, according to the settings Jen preset (only once!) in her SmartThermostat...



④ The SmartThermostat recognizes that Jen has left the apartment and automatically turns down the target room temp. to 65°, according to heuristics that take into account how much money Jen wants to save each month on her energy bill, and what the actual temp. is outside, and what the forecasted temp. is during the rest of the day.



⑤ When Jen comes back from work in the evening, SmartThermostat recognizes her presence and increases the target room temp. automatically according to the preset heuristics!

SATISFACTION

- Jen doesn't have to worry about the thermostat anymore!

- When Jen receives her energy bill, she saves a lot of money and the energy company is happy because she conserved lots of energy!

follow mode

under shot

ZOOM (example of interactivity)

X

Wanting to record the size of the crowd, George tells the butterfly to zoom out

ZOOM OUT

Introducing a level of control for the butterfly

- covered in other group story boards

☆ need to focus on limiting the number of possible interactivity commands so we don't get too ridiculous ☆

More commands makes them harder to remember, alternatively NLP and all that entails (i.e. does it understand absolutely everything and how does it know the limits of what it can physically do)


What is a Whiteboard
Darts
Throw things @ it
Ideas
Physical vs. Digital
Remote vs Co-located
Fog House
Domains
Small Groups
Brainstorming
Meetings
In More Than One
Social Norms
3-4 @ Board
5-6 in Room
Technology
Interruption
RFID's
Physical Pucks on Board
Mind Map
Other Media
Magnets
Physical Artifacts
Whiteboard
Ambient Media
Shared Calendar
Clock Use
Map - Location
Friend
Weather
Business
Gossip Whiteboard
Controllers
Mouse
Button
Keyboard
Jog Dial
Range Sensor
"People Orientation" Sensor
Camera
Identity Recognition
Oil & Water
Cues
Olfactory
Fog Machine
Physical Topology
Fog Display
3-D
Boundries
Whiteboard
Displays
Passive / Ambient Display
Active Response
Based on Position
Butcher Paper
Form Factors
Digital Projection + Write w/ Pen
Multiple Devices
(Access! + Manipulation?)
Whiteboard of Future
- Walk into Room
Display Design Work
Ambient Display of Work
- Draw & Extrude 3-D Whiteboard
- Multiple User Control
- Personal Tablets
- Voice
- Invisible Ink Voice Activated
- Annotation & Identification Based on Individuals
- Ambient Monitoring of Other Data Streams
Guest Book for Storyboard
Lazy Susan
Film Strip
Time Based Whiteboard
Automatic Tagging of Ideas
Who writes what
Audio Whiteboard
Animation
Layering, Teaching
History
Projection of User
Storyboarding
Tablet → Space on Board
Group as Individuals
Preparation
Presentation
Tables
Related Work
Table - Whiteboard Ensemble
Comes w/ Physics
Compelling
Pseudo Physics
Whiteboard Plotter
Scenarios
Persistance
Meetings
Prepared Sketches
Public
Visualize & Share
Repeat Sketching
1) Do Stuff - Autocapture
2) Do Stuff Manual Transcriptions
Iteration on Design
Computers

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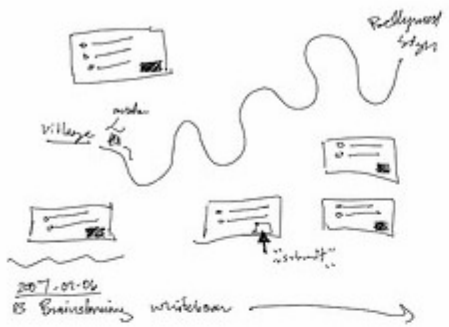
View as slideshow



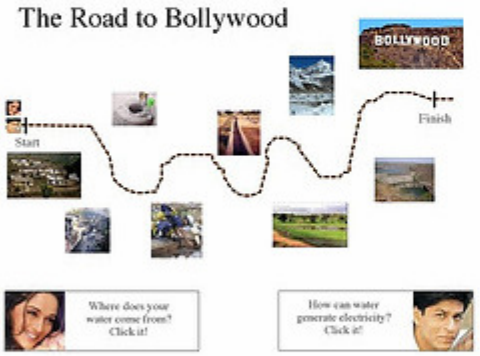
P3 Track Concept #3

Uploaded on 2 January 2008

By **andy.brooks**

See more photos, or visit andy.brooks' profile.

p3, cs247



P3 Game Board Proposal

Uploaded on 29 December 2007

By **andy.brooks**

See more photos, or visit andy.brooks' profile.

p3, cs247

P2 Skit Storyboard

Uploaded on 29 December 2007

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storyboard, p2, skit, cs247 ...

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Mike Krieger's excellent cs247 summary

A video introduction to **cs247**...**cs247**-2005 **cs247** hci stanford

Added: 1 year ago
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From: virtuallykc
★★★★½
02:21
More in Howto & Style

cs247-wii-boxing

Jeff and Tyler square off on the big screen. Don't you want to take **cs247** too?...**cs247** **cs247**-2007 wii boxing

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CS247 Demo

Demo of **CS247** GreenCode...GreenCode

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More in Howto & Style

smart shopping cart

cs247...**cs247**

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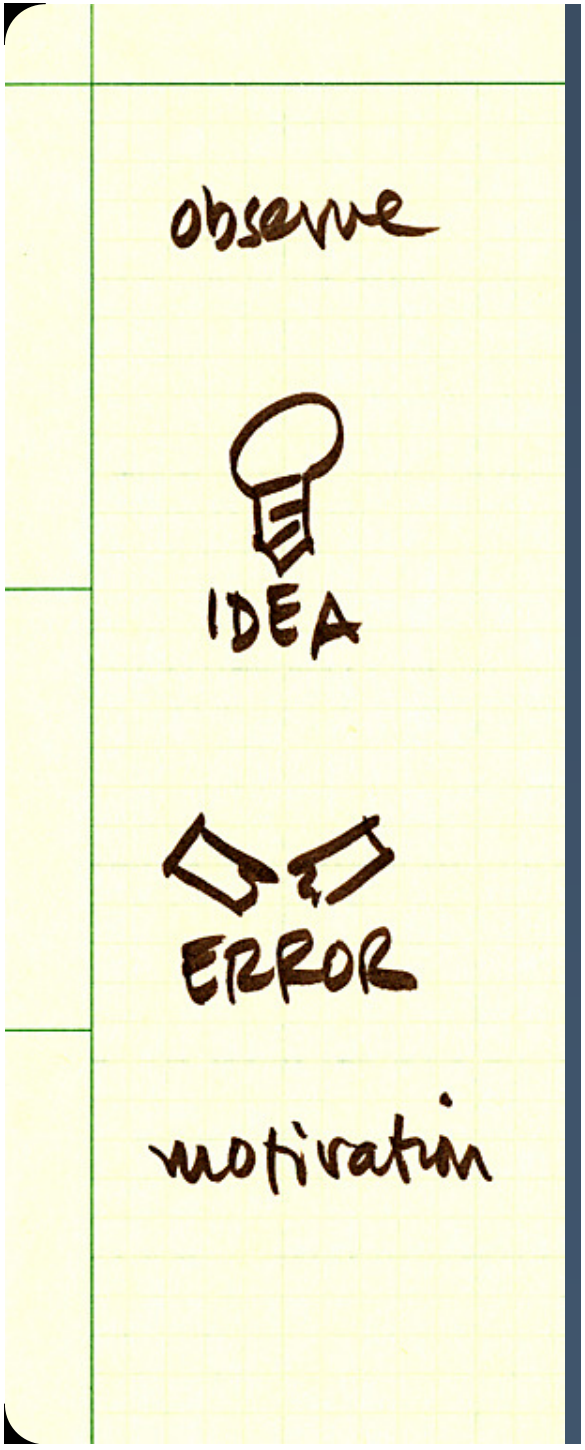


P1 Human Error

What happens when things don't work?

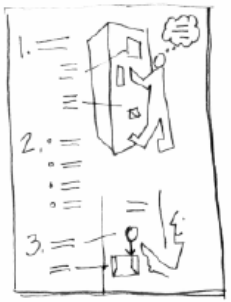
As Yogi Berra said, "You can observe a lot by watching." In this project you will practice observing people and their interaction with objects or machines, with an eye to understanding what happens when things don't work as intended. Find a situation where you can observe a human "error" and pay attention to what really happens. Consider an error to be any noticeable mismatch between what the person desired or intended and what actually resulted in the interaction.

The goals of this project are to

- Observe human-machine or human-computer interaction in detail
- Analyze the interaction to understand the situation and the factors that contribute to the "error"
- Explore alternative design solutions that mitigate or eliminate the error.
- Make a strong start in your Idea Log.

Error Sketches: Read the Norman section on errors and look around you for potential situations of human error – just watch your own behavior and that of people you are familiar with. Consider situations or machines where "human errors" might happen (vending machines, copiers, *etc.*). These could be low tech (like a door handle) or high-tech (like a PC interface). In your Idea Log, compile a list of these situations and bring it to class on Thursday. During class we will discuss the diversity of errors, and you will select a particular situation for more intensive observation.

Posters: make a closer observation of the situation you have selected, analyze what's going on, and describe your design solutions. Prepare a two-page (11" × 17") poster illustrating the human error that you observed. The poster should include:



1 A sketch (or annotated photo) of the **situation** indicating the **person** and the **interaction**.
2 A description of their **motivation** and **task goals.**
3 A description and analysis of **what the error is** and a list of the **contributing factors** (and people) to the error.
4 One or more **design ideas** about how to avoid or survive the error.

Come to class prepared to display and discuss your poster. Use **simple sketches** and **bold lettering** on your poster so it can be easily read from 4 to 6 feet away.

More on the Idea Log

We will give you a notebook that will serve as your Idea Log for the quarter. As you collect your observations and prepare your poster presentation for this project, begin making your Idea Log the center of your conceptual workspace for the course. Use your log as a place to:

- Compile a list of errors or mistakes you have personally experienced
- Brainstorm a list of places you might go to watch for people and errors

① HUMAN ERROR – DOORKING ENTRY SYSTEM

LEOR VARTIKOVSKI

② MOTIVATION: ENTER THE BUILDING & DELIVER PACKAGE TO CORRECT RECIPIENT

TASK GOALS: LOCATE CODE FOR RECIPIENT NAME → RING UP TO CORRECT APT. → OPEN THE DOOR

INTERACTION

- READ INSTRUCTIONS
- PRESS (A)/(Z)

⇓

"M" NAMES DISPLAYED

⇓

ABANDON NAME SEARCH

⇓

TYPE IN APT.*

⇓

WRONG APT.

⇒ GIVE UP!

③ CONTRIBUTING FACTORS

- UNNATURAL LABELING OF BUTTONS (WHERE IS REST OF ALPHABET?)
- INSUFFICIENT FEEDBACK – OTHER NAMES?
- INADEQUATE INSTRUCTIONS
+ MUST KNOW SURNAME

④ DESIGN IDEAS

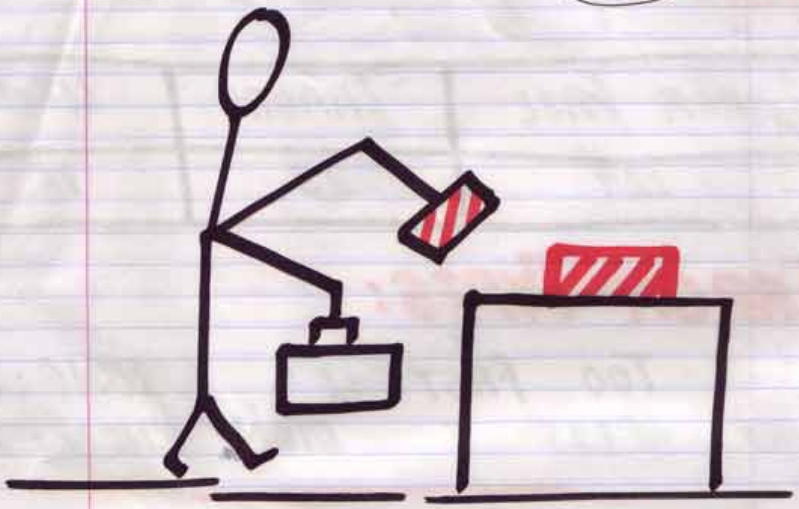
- LABEL BUTTONS WITH ARROWS: MOVE UP & DOWN IN ALPHABET OR FORWARD/BACK

OR

- NO NEED TO "FIND" CODE JUST ENTER APT.*

HUMAN ERROR @ THE GREEN

ADI



TASK: ENTER GREEN

MOTIVATION: TO READ.

ISSUES:
1) REMOVAL
2) SLOWS DOWN
3) HURRY
4) LINE UP SLOT

'BOOKS BEHIND BARRIERS'

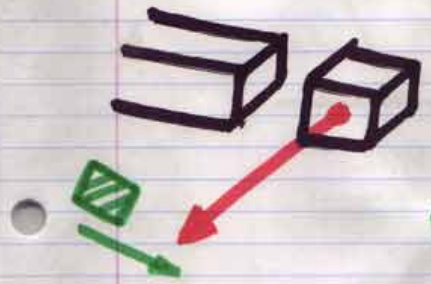
DATA: 1/10/04. 1332 - 1433

ERROR FREE	ERRORS	'LET-IN'
127	23	16

ERROR TYPES:

TOO FAST: 12 WRONG: 3
NO ACCESS: 5 DIDN'T KNOW: 2

SOLUTIONS:



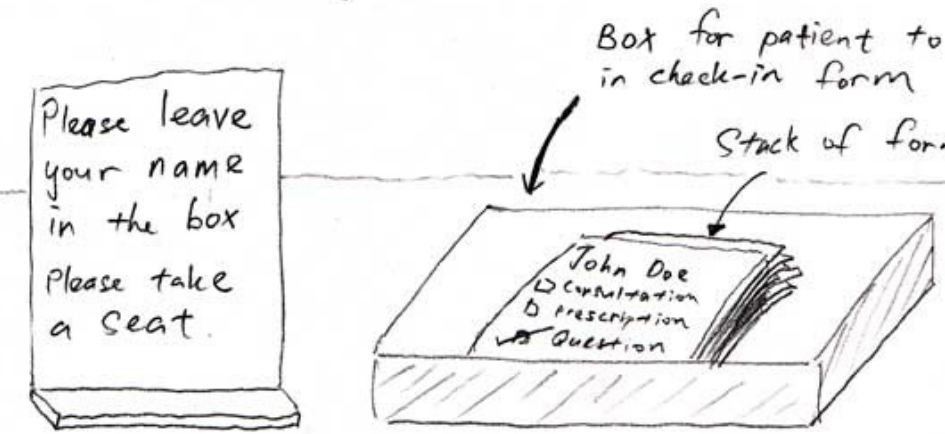
'HOW-TO'

ADI

Vaden Pharmacy Bin

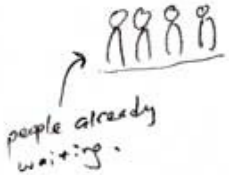
Wilson Chew

In Vaden Pharmacy dept, they take order like this



Problem

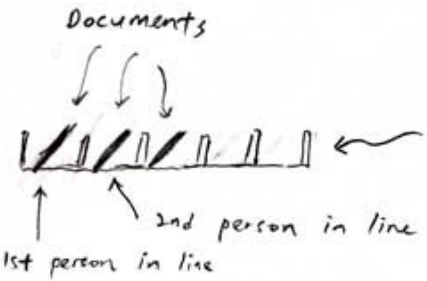
- should I stack my form on top of others that are already there?



- or should I put mine at the bottom of stack? What if the pharmacist assume most people would put their form on top and therefore take the order from the bottom. (I found out they actually do)

Motivation - line up to see a pharmacist.

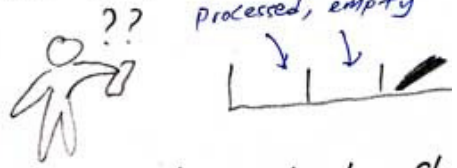
An Alternate



- Better
person
several
[instead

Disadvantages

① After first few people had been deal-
slots on the left become empty, la-
know which side to put in his/he



② After a while, forms have to be sh
left manually for new empty s

so new c

IDEAS

① For the Vaden Bin, put a sign specif
people to stack on top.

② - A round rack
- Put a sign asking people to put forms

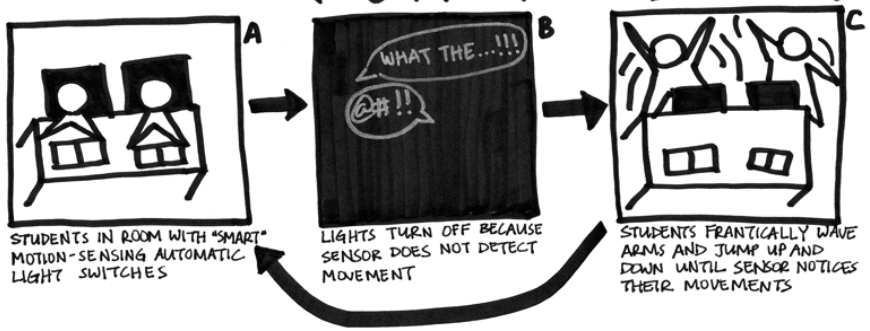
Birds Ey

P1 HUMAN ERROR

By Clara Shih

(NOT) ^SMART MOTION SENSORS

1. SITUATION...



STUDENTS IN ROOM WITH "SMART" MOTION-SENSING AUTOMATIC LIGHT SWITCHES

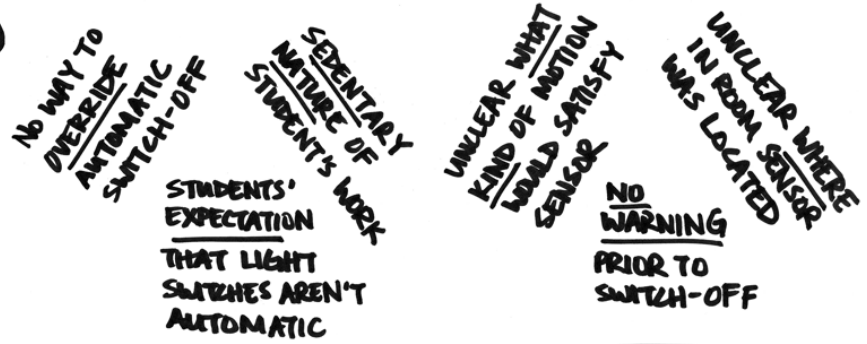
LIGHTS TURN OFF BECAUSE SENSOR DOES NOT DETECT MOVEMENT

STUDENTS FRANTICALLY WAVE ARMS AND JUMP UP AND DOWN UNTIL SENSOR NOTICES THEIR MOVEMENTS

2. MOTIVATIONS...

- INITIALLY, THE TASK GOAL IS TO MAINTAIN THE STATUS QUO OF A LIT ROOM. THE STUDENTS BELIEVE THIS CAN BE ACCOMPLISHED BY DOING NOTHING (IE, CONTINUING TO STUDY AT THE TABLE).
- ONCE THE LIGHTS TURN OFF (IN 'B') THE NEW MOTIVATION IS TO TURN THE LIGHTS BACK ON BY ACTIVATING THE MOTION SENSOR. THE STUDENTS ARE UNSURE AS TO HOW THIS CAN BE DONE SO THEY HAPHAZARDLY MOVE AROUND (INCREASING FREQUENCY AND RANGE OF MOTION) UNTIL LIGHTS COME BACK ON IN 'C.'

3. CONTRIBUTING...

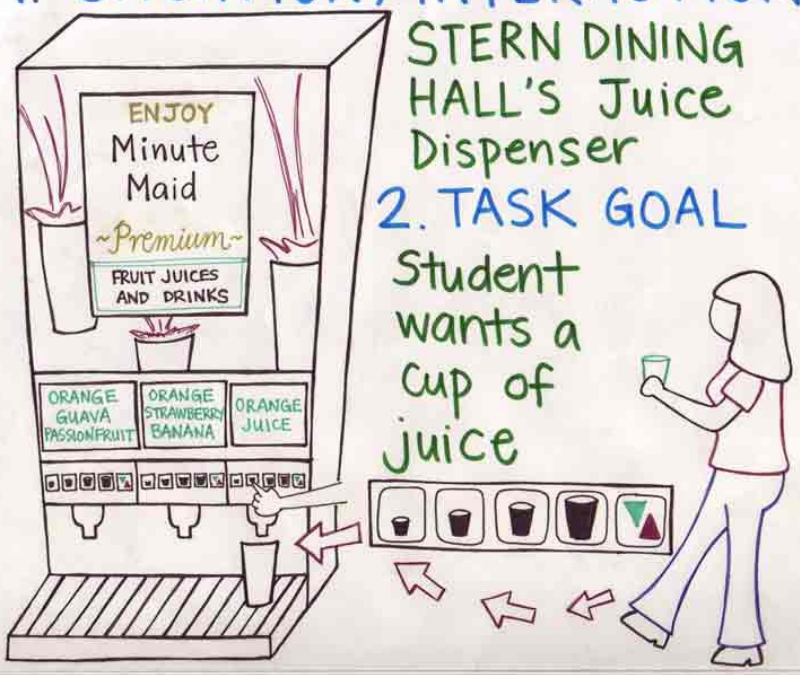


4. IDEAS...

AVOID	SURVIVE
- manual overrides "ON means ON!" - or, no automation in the first place! - students bring in moving toy or antsy friend - stretch breaks every 5 mins	- bring your own flashlight! - learn to live in the dark - continue the haphazard-jumping technique!

1. SITUATION / INTERACTION

STERN DINING HALL'S Juice Dispenser



2. TASK GOAL

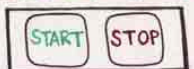
Student wants a cup of juice

3. FACTORS

- dining hall cups are the same size
- machine can't accommodate big cups
- button behavior is inconsistent
- buttons are deceiving, confusing
- different conceptual models

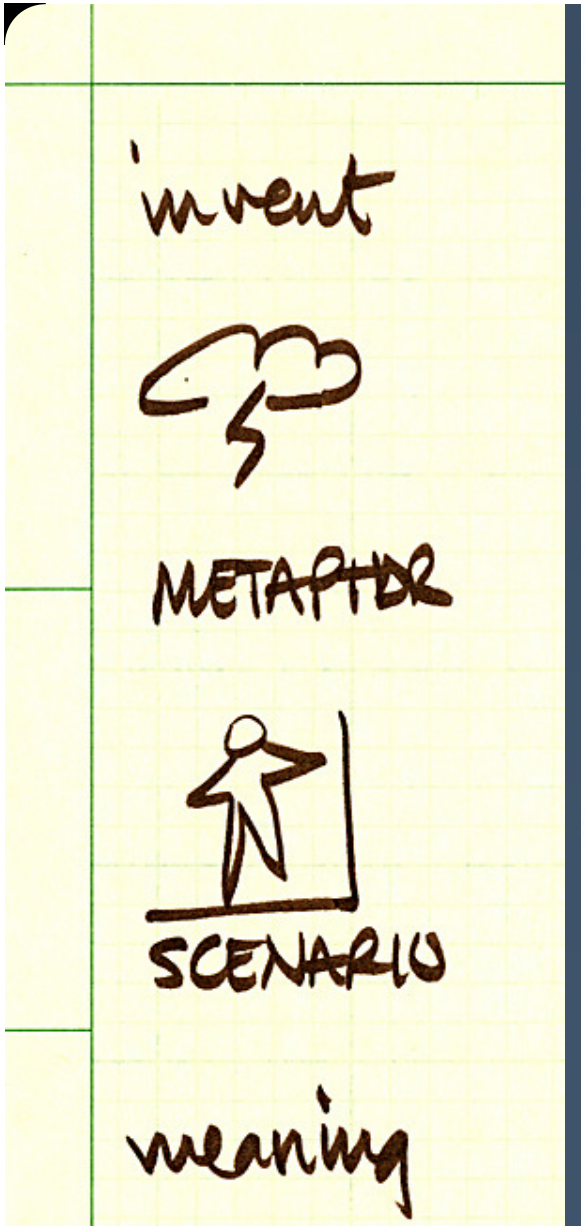
4. IMPROVEMENTS

- fewer buttons
- automatic start / stop buttons



(color-coded)

- [weight-sensitive] sensors
- use words instead of pictures



P2 Farmers Market

Due Tuesday, 31 January

The traditional graphical user interface—with a keyboard and mouse input, and a desktop display as output—was designed for seated office workers. Increasingly, computing is extending beyond the desktop and into the world. In this project, we'll explore a particular location—the San Francisco farmers market—as a way of introducing need-finding and ideation skills. This urban location features several distinct user groups (*e.g.,* farmers, grocery shoppers, tourists), each with distinct goals. And like most practices in our lives, the nominal task of purchasing groceries serves as a vehicle for many other goals. From the CUESA website, "farmers markets and local food systems build community ties and encourage civic life, offering urban residents a 'small-town experience' of buying directly from farmers, feeling connected to the land where their food is grown, and exercising consumer choice about how their food is grown."

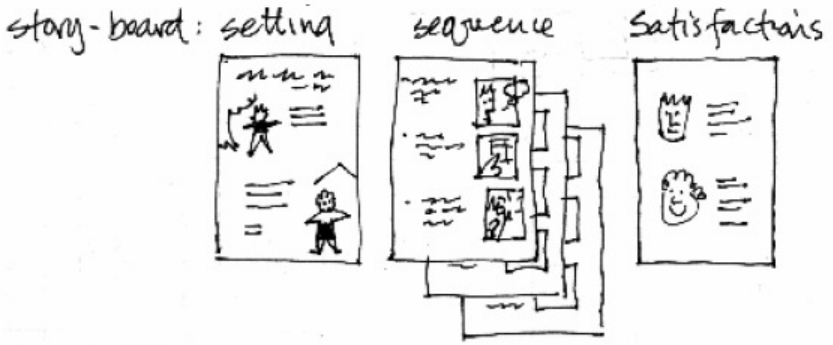
The *skills* we will learn in this project are

Observation Use the contextual inquiry techniques described in the Beyer and Holtzblatt reading. We first spent time observing for P1; this time, we're observing the practices of a community *that's not us*, which means that we must work *more critically* and *more actively*. Bring your idea log and a camera! Take pictures, write notes, sketch.

Ideation Brainstorm, brainstorm, brainstorm – and get the ideas on paper. Work on getting as much *breadth* as possible.

Storyboarding Flesh out your ideas by *writing scenarios* and *creating storyboards.*

Bodystorming Show how users might interact with your envisioned technology by performing a *skit*. This skit should demonstrate both the *motivation* for your idea and an *interaction scenario*. Integrating pictures, costumes, and props will help.



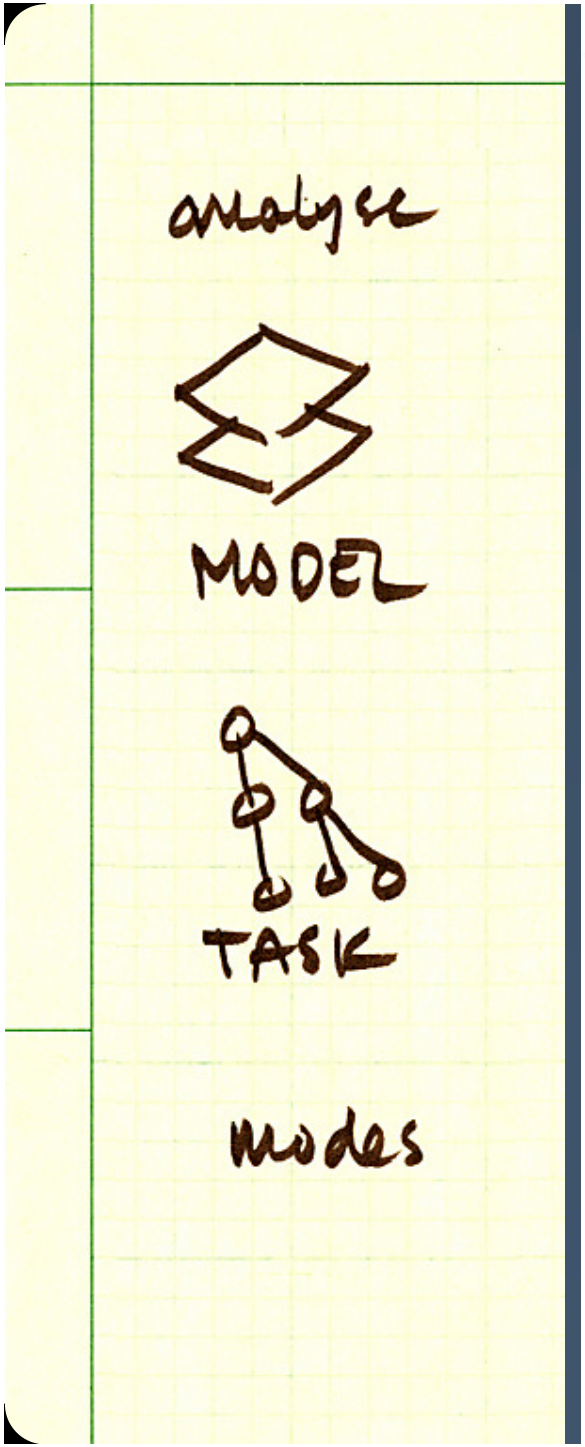
The *deliverables* are due on the following schedule

Thu, 19 Jan **Individual brainstorm and observation plan**
- Read pages 36-60 of Contextual Design.


FUYU
DRIED MANDARIN
DRIED ASIAN PEAR


SAMPLING
IS
MANDATORY!
WE'RE WATCHING


ORGANIC
OLIVE OIL
250ML 500ML 1000ML
$7.00 $11.00 $19.00
BALSAMIC VINEGER $12
Balsamic



P3 Connections

Prototypes are the pivotal medium for innovation, collaboration, and creativity. Prototypes help in four ways. First, visually and physically representing your ideas will yield surprising, unexpected discoveries that uncover problems or generate suggestions for new designs. Second, prototypes help team communication and understanding because the tacit knowledge of individuals is rendered visible to your entire team. Third, prototypes enable user feedback and usability testing. Finally, prototypes are also important sales tools in client relationships. P3 is about building and testing prototypes.

In this project and in P4, we will work with the Reuters Digital Vision Fellows. These fellows spend one year on Stanford's campus developing their ideas for social entrepreneurship and technology. They will describe the technology problems and opportunities in their work, and will serve as mentors to groups. The theme of our partnership is *connections*—between people, between devices, between services… (we'll let you interpret).

The *skills* we will learn in this project are

Mental Models What are a user's theories about the design and functioning of your prototype? What organizing principles should structure your design of the prototype, and what mental models do these principles yield?

Prototyping In P3 for the first time, we will create an *interactive* prototype. This can be in Flash, Java, C#, or whatever other tools you are most comfortable with.

Heuristic Eval Heuristic evaluation is a usability method that employs "experts" (in this case, your peers) to inspect an interface. Long advocated by Jakob Nielsen, It has gained wide appeal as a "discount" usability method because heuristic evaluation can be much faster and cheaper than traditional usability testing.

Iterative Design We prototype to gain feedback (from ourselves or others). With that new knowledge, we iterate. We prototype to gain feedback (from ourselves or others). With that new knowledge…

The project has the following *deliverables* (see course website for due dates)

Brainstorm and Proposal

- In your idea log, *brainstorm* at least 30 ideas related to the digital vision presentations.
- *Bring in* a simple one-page text-graphic proposal describing your favorite concept from your list. Include a brief outline of your target user persona – who wants to use this and why? You will turn this proposal in at the end of class.
- In class, *form pairs*.

Interaction Models

- In your idea log, explore *alternatives* for organizing principles, metaphors, models, and representations that might be used for organizing your selected concept or process

P4 Integrating Physical and Digital

> *The body is the ultimate instrument of all our external knowledge, whether intellectual or practical... experience [is] always in terms of the world to which we are attending from our body.* — *Michael Polanyi*

Physical media and electronic media have powerful—but distinct—sets of affordances. Today, our physical devices and electronic devices are proximate yet unaware of each other. Considering the limited interface of the PC, one might presume that current computers think we look something like the image to the right (drawing courtesy Dan O'Sullivan and Tom Igoe). However, our experiences in the world beyond the PC engage our entire bodies. This project is about putting mind and body, bits and atoms back together. You will use sensing and actuation technologies (*mechatronics*) to transcend the confines of the desktop and engage the user and their environment more fully. You will be working in groups of three or four, and the Digital Vision Fellows will be mentors again. Based on the results of a P3 *connections* prototype (not necessarily your own), form a group, and extend your chosen connection with a tangible interface. We suggest using d.tools, which we have made available, but you are welcome to use any physical interface components you are comfortable with.

The *skills* we will learn in this project are

Production Until now, we have concentrated mostly on ideation and prototyping. In P4, completeness and panache count.

User Testing Testing is an essential part of user-centered design, and a good way to get empirical information about how real users work with interactive systems.

Physical UIs This project will focus on the *controls* and *displays* that your user interface provides. We will learn both the technology and the design skills for creating these interfaces.

Teamwork This is the most comprehensive project of the course, and to make it work, you will need to work together as a team to acquire new skills and complete the assignment.

The project has the following *deliverables* (see course website for due dates)

Group Proposal

- Using the results of a P3 *connections* prototype as a starting point, form a group of four.
- Write in your Idea Log one critique of the P3 you are building on, and one inspiration that seeing the prototype gave you.
- Come in with a storyboard of your physical interaction design (in your Idea Log).

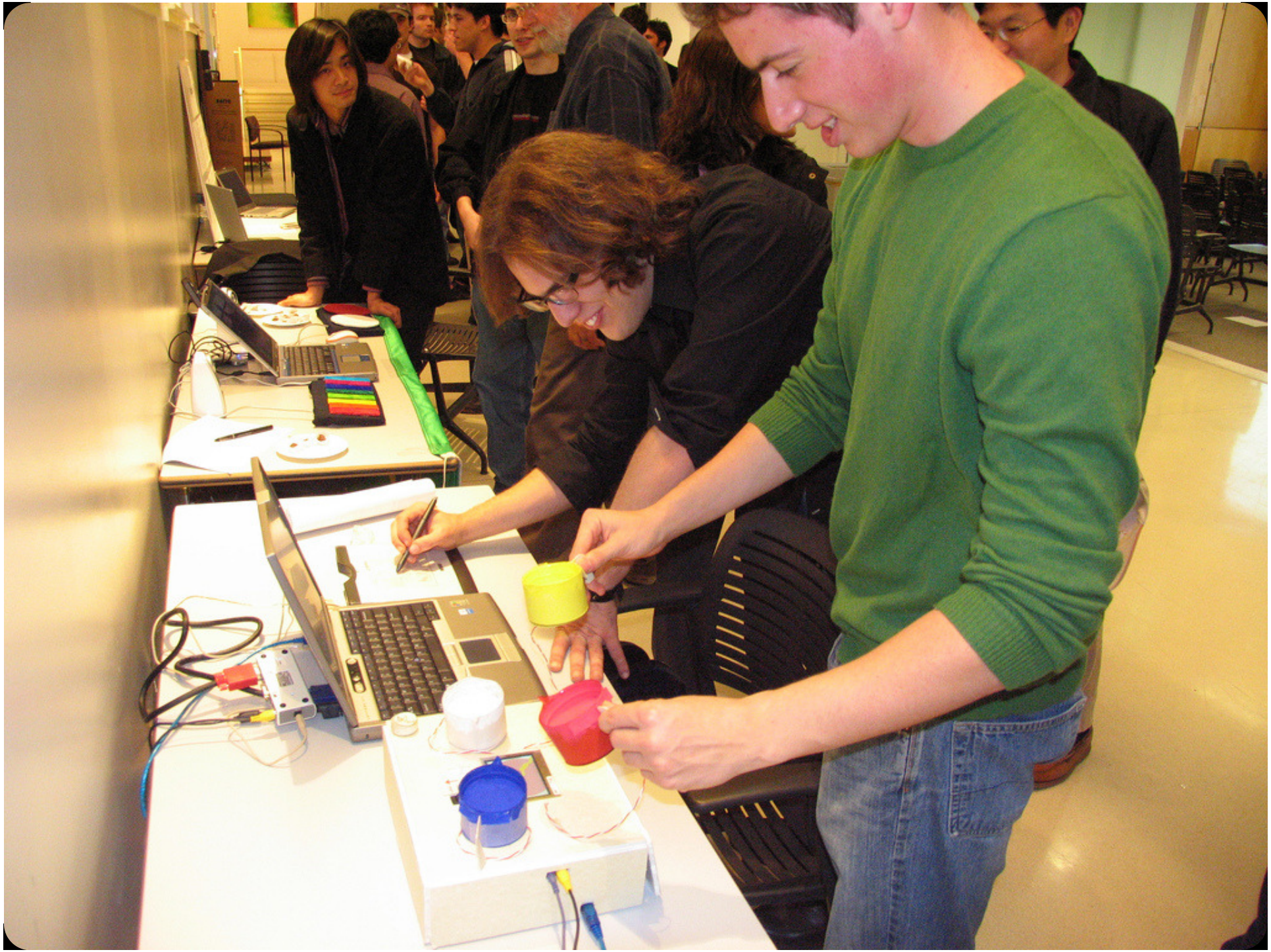
Interactive Prototype

- Bring a prototype to class.

User Test Preparation

- Bring in an updated prototype.


Is Sutra about?
- fair trade
- fashionable clothing
- new opportunities

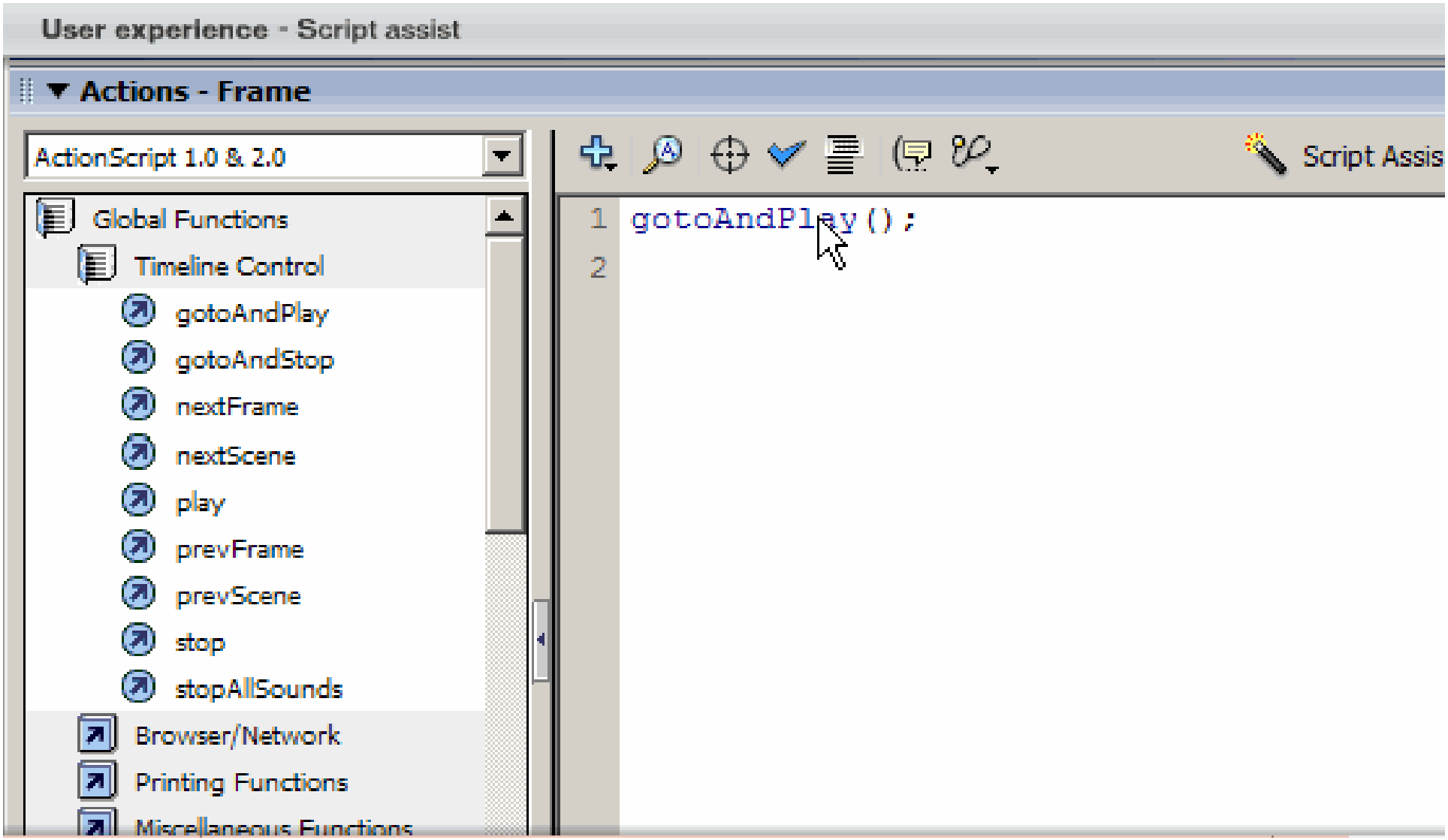


Today

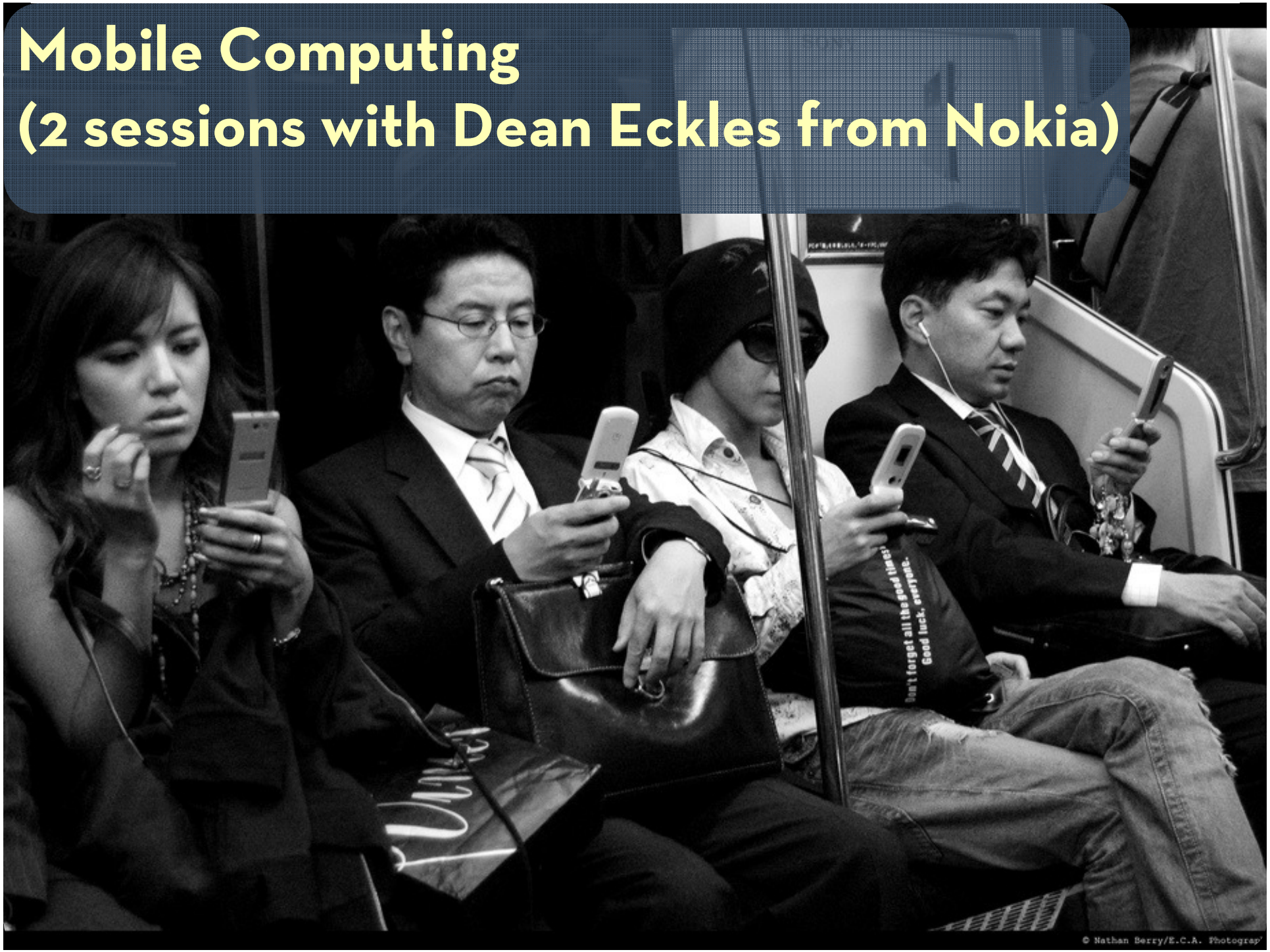
- Teaching staff & student introductions
- Course content
- **Lab section**
- Course administrivia


Product Realization Lab

Flash (2 sessions with Ty Lettau from Adobe)

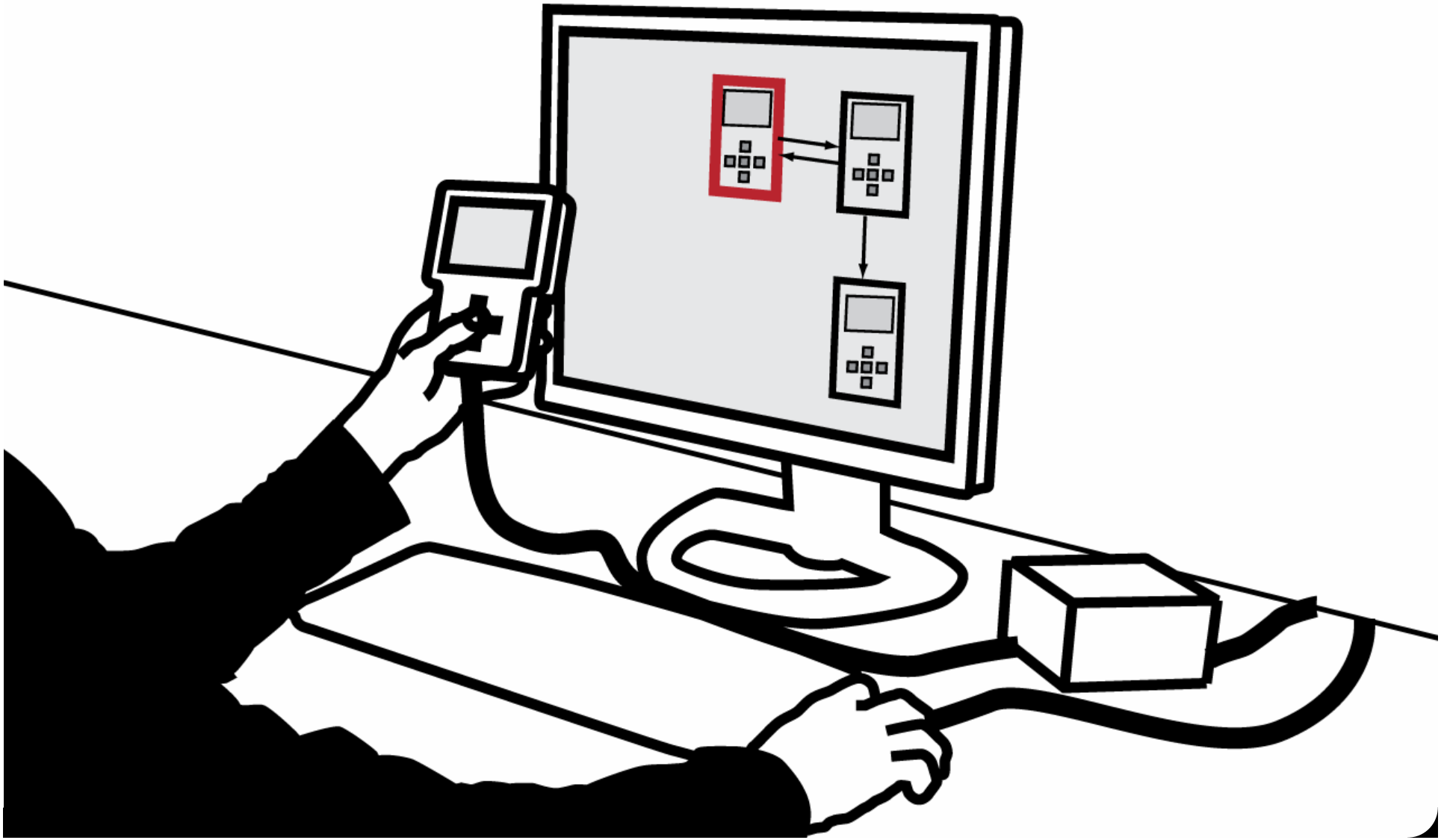


Mobile Computing
(2 sessions with Dean Eckles from Nokia)



Soldering and Electronics

Physical Computing (arduino)




Leveraging Existing Software
San Francisco
Presidio Golf Course
Geary Blvd
Euclid Ave
Baker St
Fillmore St
Bush St
Pacific Ave
Van Ness Ave
Broadway
Taylor St
Lombard St
Presidio Blvd
Geary St
Market St
Mission St
1st St
Golden Gate Ave
Fulton St
Balboa St
Oak St
Duboce Ave
Waller St
Kezar Dr
Crossover Dr
Lincoln Way
Judah St
7th Ave
17th St
Market St
Castro St
Guerrero St
Dolores St
16th St
20th St
Central Skwy
James Lick Fwy
6th St
4th St
7th St
3rd St
SBC Park
Clipper St
Cesar Chavez
Portola Dr
30th St
Taraval St
28th Ave
19th Ave
1
80
101
280

Video Making and Editing

Lab Questions or Suggestions?

We have some flexibility if there's something relevant that you're especially interested in learning

Today

- Teaching staff & student introductions
- Course content
- Lab section
- **Course administrivia**

Administrivia

- Course Info

  Tuesdays and Thursdays
  1:15-3:05pm, Wallenberg 124 & 127

  http://cs247.stanford.edu

  cs247@cs.stanford.edu

- Terry's Info

  Office Hours: Wednesdays 10am-12:00pm, Gates 388

  http://hci.stanford.edu/winograd

  winograd@cs.stanford.edu

cs247@cs

Two Sections

- We'll sometimes meet together and sometimes separate
- We'll announce section assignments on Thursday

Projects & Grading

10 Jan **P1: Errors** *(individual)* 5%

22 Jan **P2: Getting Rid of Things** *(groups)* 10%

14 Feb **P3: Connections** *(pairs)* 25%

17 Mar **P4: Integrating Physical & Digital** *(groups)* 35%

Idea Logs 20%

Participation 5%

Expected background

- This course has cs147 as a prerequisite – we'll assume basic HCI knowledge.
- You're also responsible for having sufficient skills in your group to "do the projects"

STANFORD HCI GROUP

Home | Research | Academics | People | Publications | Software

HCI Courses at Stanford 2007-2008

Will be updated as the year goes along. Some listings may change and new courses will be added.
See also the list of courses related to HCI.

Weekly HCI Speaker Series (CS547) Seminar on People, Computers, and Design Every Friday at 12:30 during the academic year Open to the public and available on the web	**CS377 Note:** Courses marked with an asterisk count as the equivalent of CS377 for the CSMS requirements. Due to changes in the registrar's rules, they are no longer listed for enrollment as a CS course. All courses on this page count in category C on the program sheet.

Winter 2008

- CS247 - Interaction Design Studio (Terry Winograd)
- CS377S - Designing Applications that See (Dan Maynes-Aminzade)
- Other classes to be added soon

Spring 2008

- CS376: Rsearch Topics in Human-Computer Interaction (Scott Klemmer)
  Wallenberg 124 - Tuesdays and Thursdays 1:15-2:30PM
- EE353: Business Management for Electrical Engineers and Computer Scientists (Fred Gibbons and Micah Siegel)
  Redwood Hall G19 - Tuesdays and Thursday 8:00-9:50AM

Today

- Teaching staff & student introductions
- Course content
- Course administrivia
- **Resources**

P1 Human Error

Due [redacted]esday, January 17

What happens when things don't work?

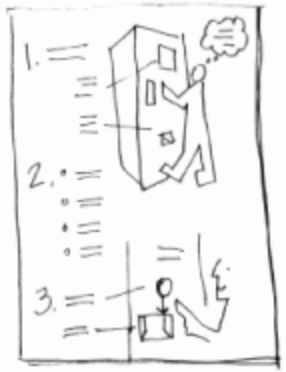
As Yogi Berra said, "You can observe a lot by watching." In this project you will practice observing people and their interaction with objects or machines, with an eye to understanding what happens when things don't work as intended. Find a situation where you can observe a human "error" and pay attention to what really happens. Consider an error to be any noticeable mismatch between what the person desired or intended and what actually resulted in the interaction.

The goals of this project are to

- Observe human-machine or human-computer interaction in detail
- Analyze the interaction to understand the situation and the factors that contribute to the "error"
- Explore alternative design solutions that mitigate or eliminate the error.
- Make a strong start in your Idea Log.

For Thursday, Read the Norman section on errors and look around you for potential situations of human error – just watch your own behavior and that of people you are familiar with. Consider situations or machines where "human errors" might happen (vending machines, copiers, *etc.*). These could be low tech (like a door handle) or high-tech (like a PC interface). In your Idea Log, compile a list of these situations and bring it to class on Thursday. During class we will discuss the diversity of errors, and you will select a particular situation for more intensive observation.

For Tuesday, make a closer observation of the situation you have selected, analyze what's going on, and describe your design solutions. Prepare a two-page (11" × 17") poster illustrating the human error that you observed. The poster should include:



1 A sketch (or annotated photo) of the **situation** indicating the **person** and the **interaction**.
2 A description of their **motivation** and **task goals.**
3 A description and analysis of **what the error is** and a list of the **contributing factors** (and people) to the error.
4 One or more **design ideas** about how to avoid or survive the error.

Come to class prepared to display and discuss your poster. Use **simple sketches** and **bold lettering** on your poster so it can be easily read from 4 to 6 feet away.

For Thursday

Complete P1: Errors

On Thursday

1:15 – 2:05 In sections: P1 discussion, form P2 groups

2:10 – 2:30 Intro to Idea Logs & Storyboards

2:35 – 3:05 Intro to P2 and Observation

Questions