

IN4MATX 148: Ubiquitous Computing Prototyping and Projects



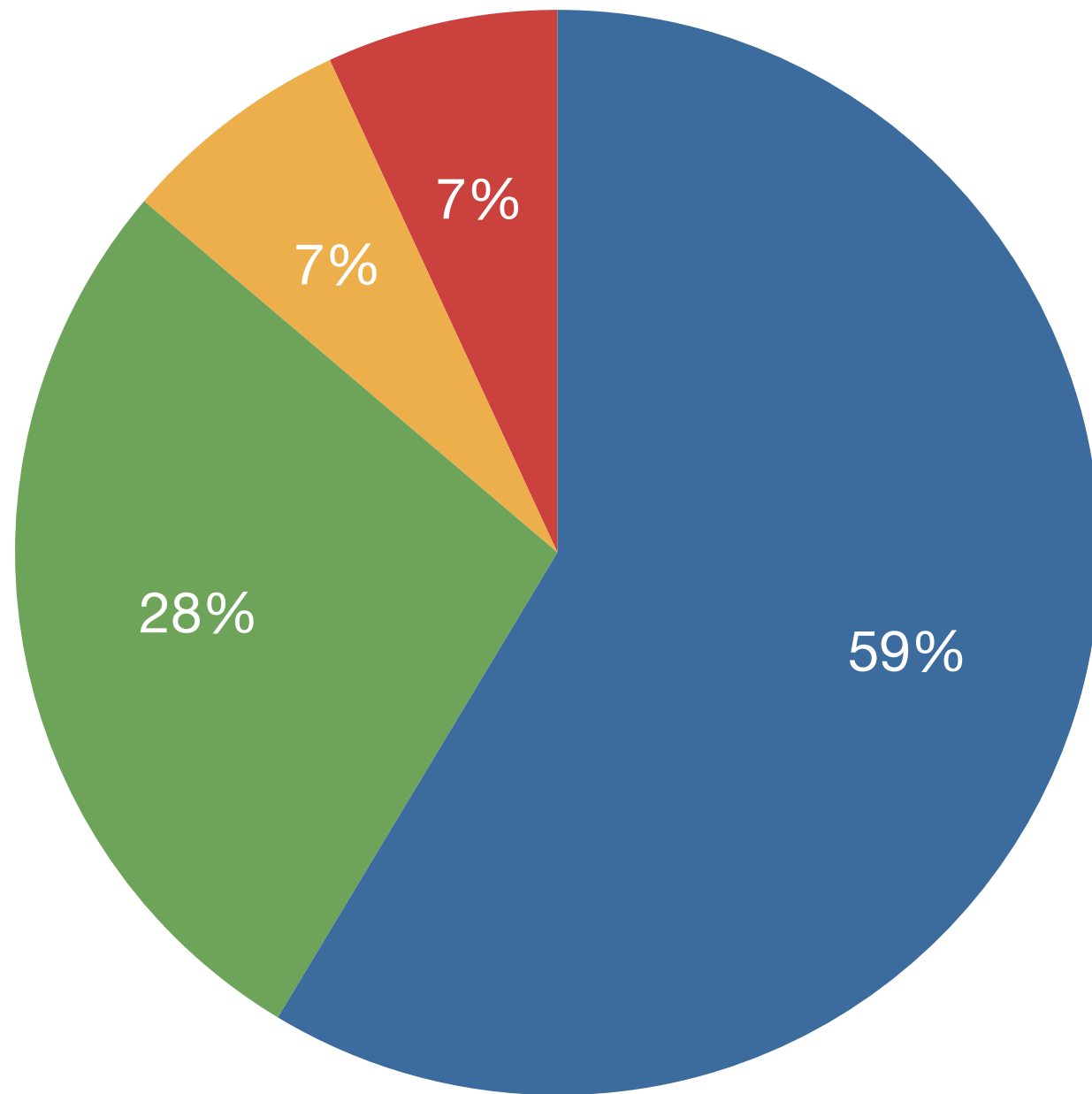
Week 3: Design Crit 1, Sketching Part II:
(Hybrid & Physical Sketches),
Ubicomp in the Home

16 April 2012
Stephen Volda
svoida@uci.edu

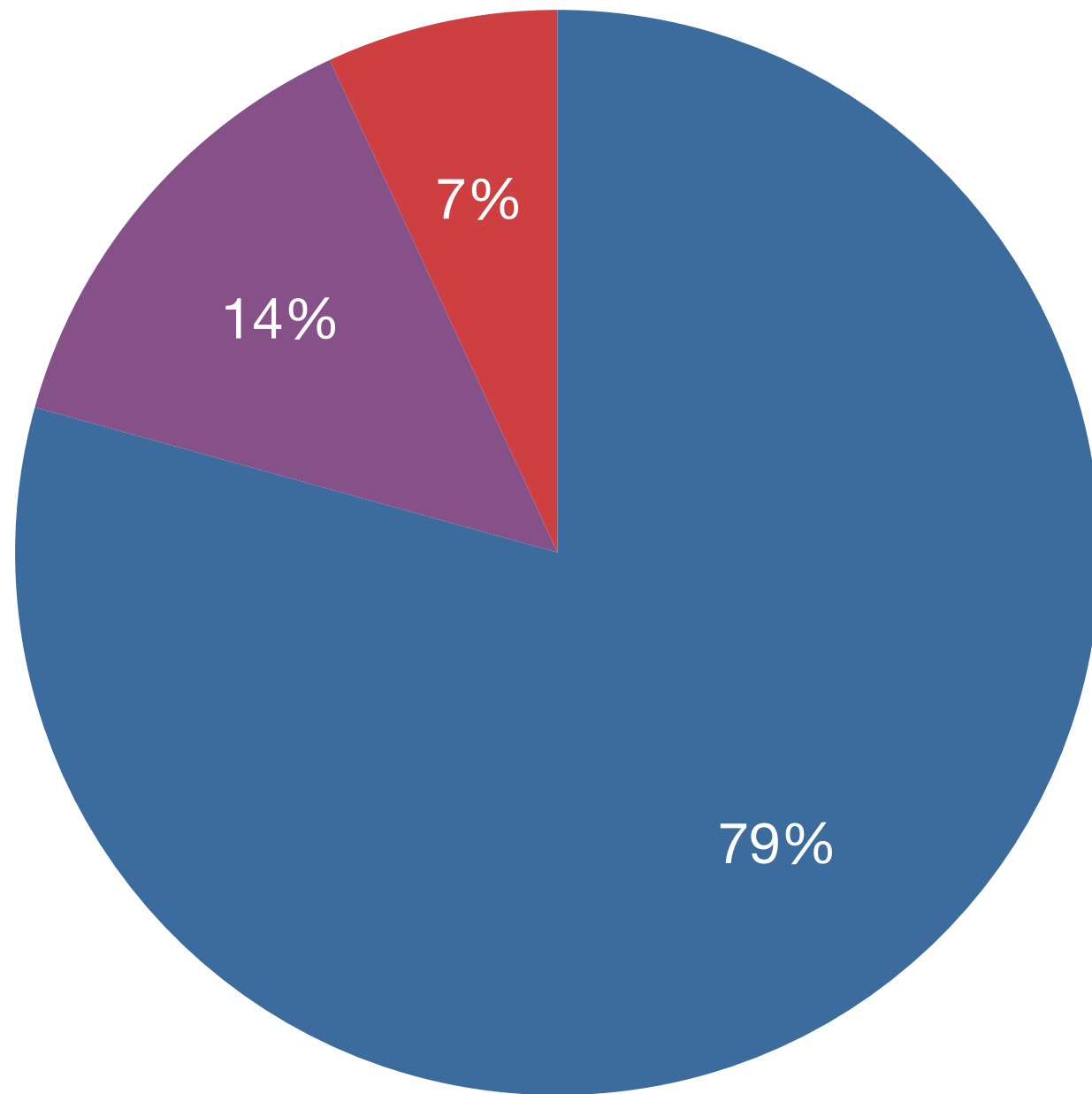
Preface: Course Logistics

- Group Projects: Teams Assigned
 - *Should have received e-mail from me about this!*
 - *Need to meet with your mentor ASAP*
 - *No need to CC me or Miya on group emails*
 - *1–2 page project overview statement (see class website for details) is due to me via e-mail by **5:00pm PDT on Wednesday, April 18***

● First Choice ● Second Choice ● Third Choice ● No Submission



● On Time ● Late ● No Submission



Preface: Course Logistics

- Group Projects: Teams Assigned
 - *1–2 page project overview statement (see class website for details) is due to me via e-mail by **5:00pm PDT on Wednesday, April 18***
- Sketching Exercise due at the end of tonight's crit
 - *Will be graded and available for pick-up on Wednesday (check EEE announcements for details)*
- Check EEE announcements, course website regularly
- Questions? Comments? Concerns?

On Deck for Tonight

- Part I: Design Crit 1
- Part II: Sketching, The Sequel (Hybrid & Physical Sketching)
 - *Hands-on Activities*
- Part III: Ubicomp in the Home
 - *Your Exercise for the Week*
- Afterword: Group Project Discretionary Time
 - *(Get Organized!)*

Part I: Design Crit 1

Quick review, recapping material by Miya Sylvester

Design Crit: Method to Our Madness

- One at the *beginning* of every class meeting
- Groups of ~5 students
- Present your work for 4–5 minutes
- *Constructively* critique your peers' work for ~3 minutes
- ~2 minutes for change-overs between presenters
- Turn in your assignments when the crit is finished

Design Crit: Instructions for Presenters

- Be creative and communicative
- Remember: “...evaluated primarily on the **creativity of thinking** represented and the **communicative effectiveness** of the deliverable; less focus will be placed on the artistic merit of the submissions.”
- Explain by introducing:
 - What the design exercise is of
 - What it is supposed to do for the user
 - The novelty of the design; where your idea(s) came from

Design Crit: Instructions for Critics

BE PROFESSIONAL!
BE CONSTRUCTIVE!

- *What is going on?*
 - Does the prototype communicate what is intended?
 - What would the design make/have the user do?
- *What is the flow of the interaction? Does it remind you of something?*
 - What would it be like to use the design?
 - Would you use the designed prototype?
 - What do you (not) like about it?
- *Does it follow a creative purpose? Is it quality work?*
 - Is it original?
 - Is it similar to another product or person's work?
 - What can be changed to make it more original?

Part II: Sketching, The Sequel (Hybrid and Physical Sketching)

based on Saul Greenberg's CPSC581 lecture materials

A photograph of a desk with various design sketches, a mobile phone, pens, and a document titled 'Stakeholder Interviews'. The sketches include a perspective view of a device with a screen and buttons, a top-down view of a rectangular device, and a side view of a device with a keyboard. A mobile phone is placed on top of the sketches. A document titled 'Stakeholder Interviews' is visible in the upper right corner, with the text 'NG 3100' and '10.21.02' written on it. A red pen and a green pen are also visible on the desk.

Sketching is about Design

From Bill Buxton slide deck. Need to attribute the photograph.

The Attributes of Sketches

- **Quick**
 - to make
- **Timely**
 - provided when needed
- **Disposable**
 - investment in the concept, not the execution
- **Plentiful**
 - they make sense in a collection or series of ideas
- **Clear vocabulary**
 - rendering & style indicates it's a sketch, not an implementation
- **Constrained resolution**
 - no higher than required to capture its concept
- **Consistency with state**
 - refinement of rendering matches the actual state of development of the concept
- **Suggest & explore rather than confirm**
 - suggests/provokes what could be i.e., they are the catalyst to conversation and interaction
- **A catalyst**
 - evokes conversations & discussion

From Sketches to Prototypes

Early design

Brainstorm different ideas and representations

Choose a representation

Rough out interface style

Task centered walkthrough and redesign

Fine tune interface, screen design

Heuristic evaluation and redesign

Usability testing and redesign

Limited field testing

Alpha/Beta tests

Multitude of sketches

Sketch variations and details

Sketch or low fidelity prototypes

Low to medium fidelity prototypes

High fidelity prototypes

Working systems

Late design

Sketches: Digging Deeper

generality

narrativity

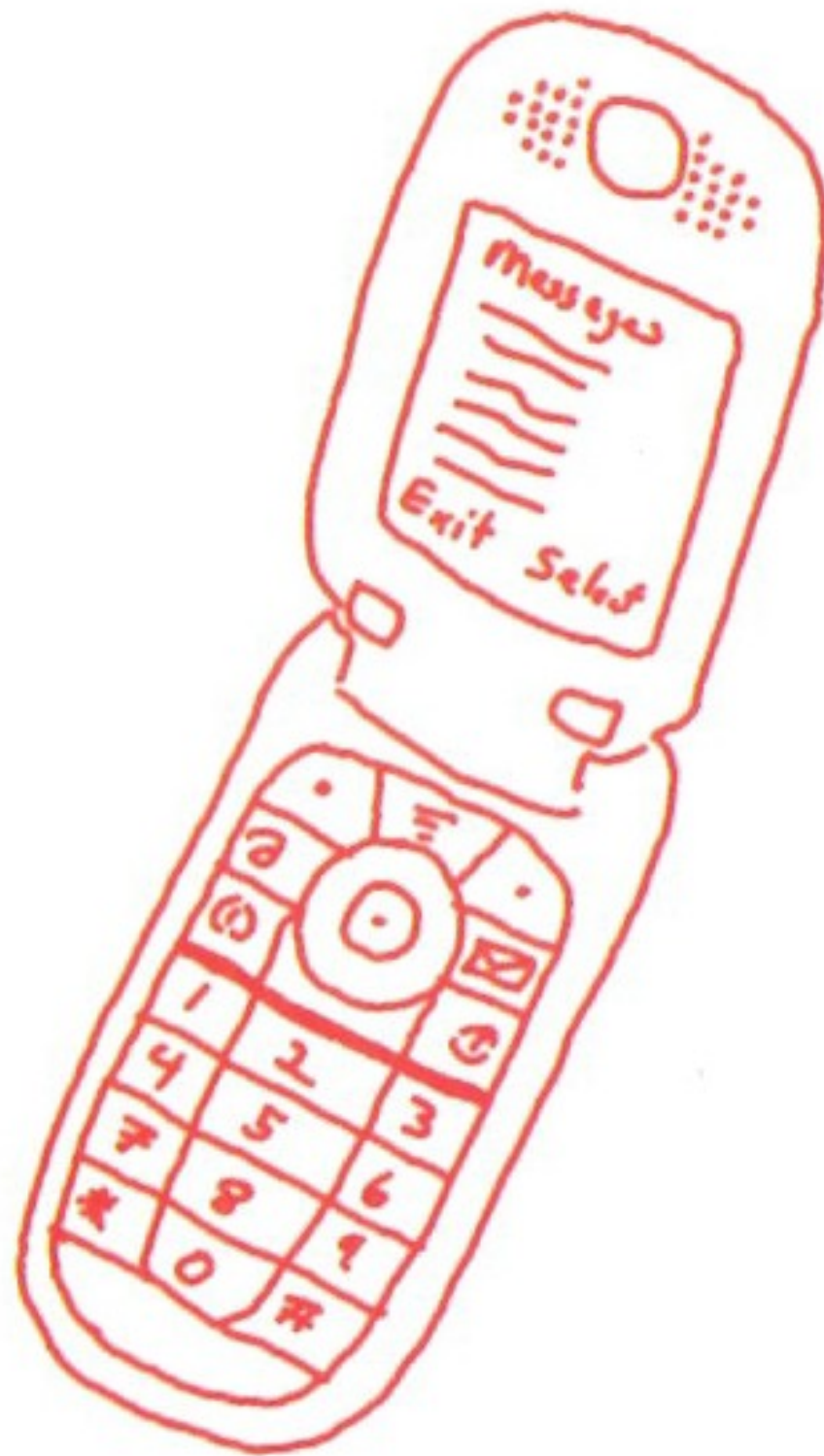
materiality

Technique: Tracing

- Basic idea
 - Copy/trace the fixed elements of an existing interface
 - Leave your design space empty
- Technology
 - Camera, photograph, tracing paper *or*
 - Photoshop (or equivalent)
 - Trace over image on a separate layer
- Drawing skill required
 - Almost zero

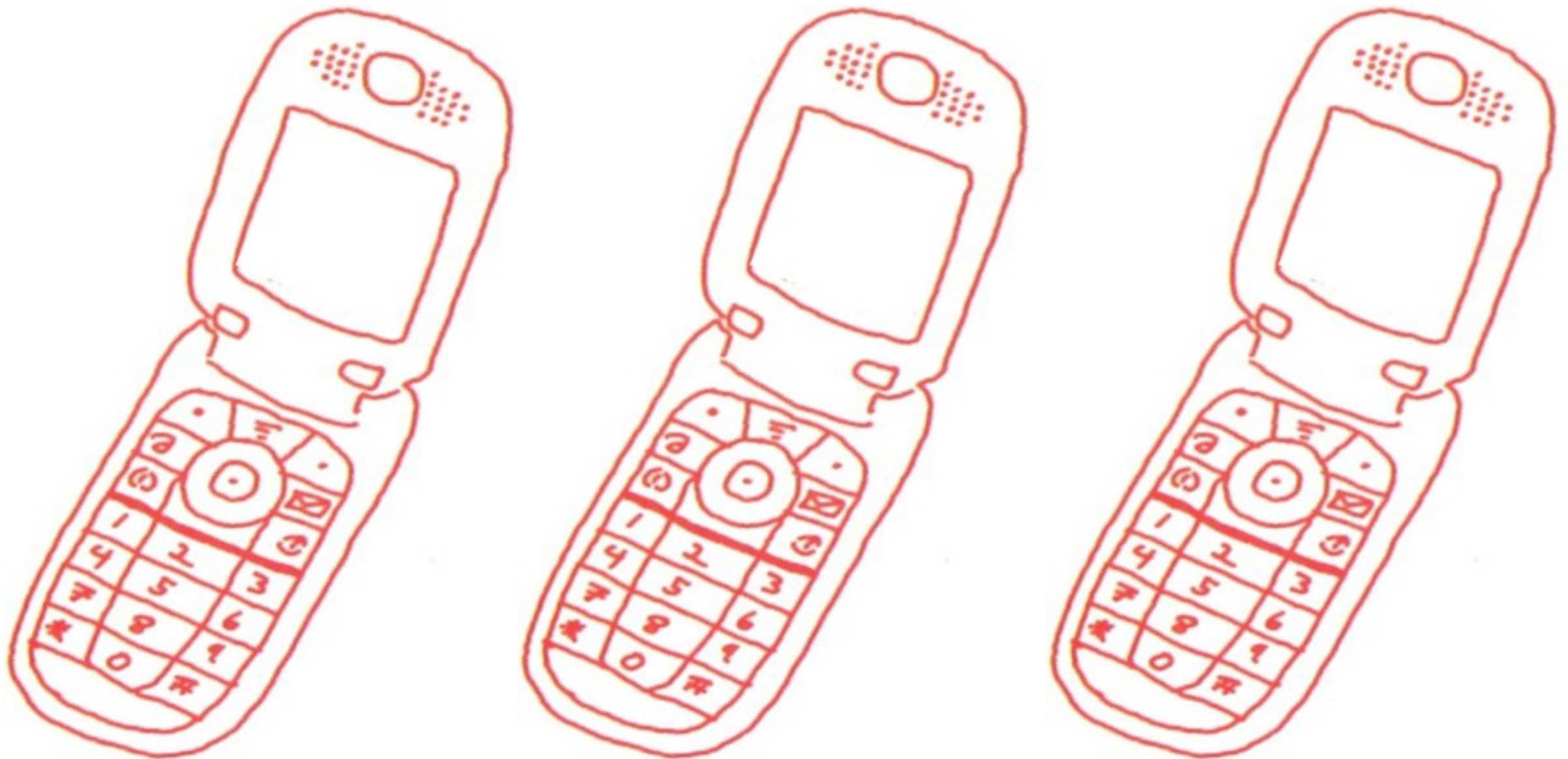






Generate Blanks for Your Designs

Screen can be filled in, phone is constant





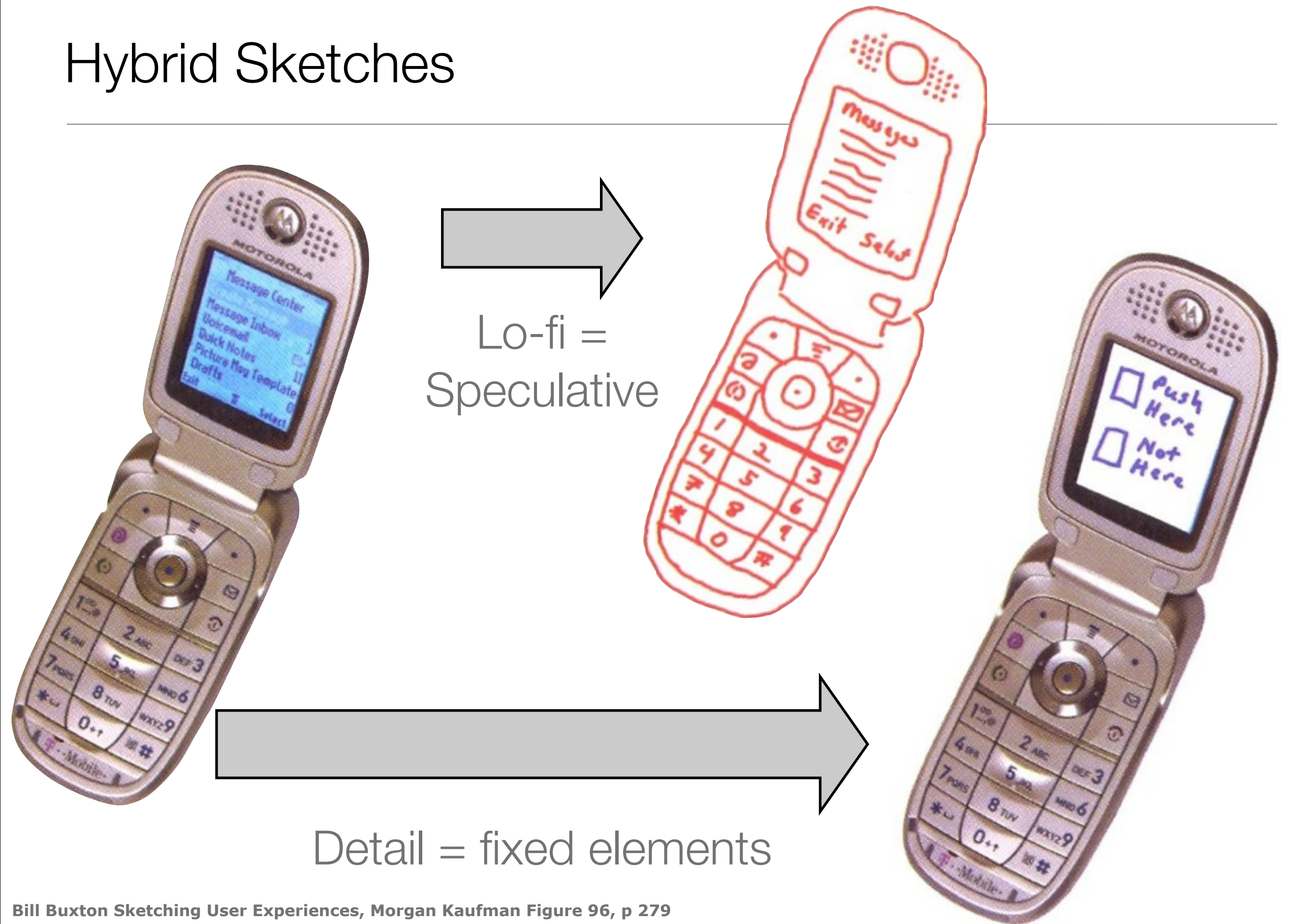


Technique: Hybrid Sketches

- Mixes full- and low-fidelity elements
- Full-fidelity portions
 - Fixed design elements
- Low-fidelity portions
 - Speculative components
- Contrast
 - Makes certain parts of sketch stand out over others



Hybrid Sketches

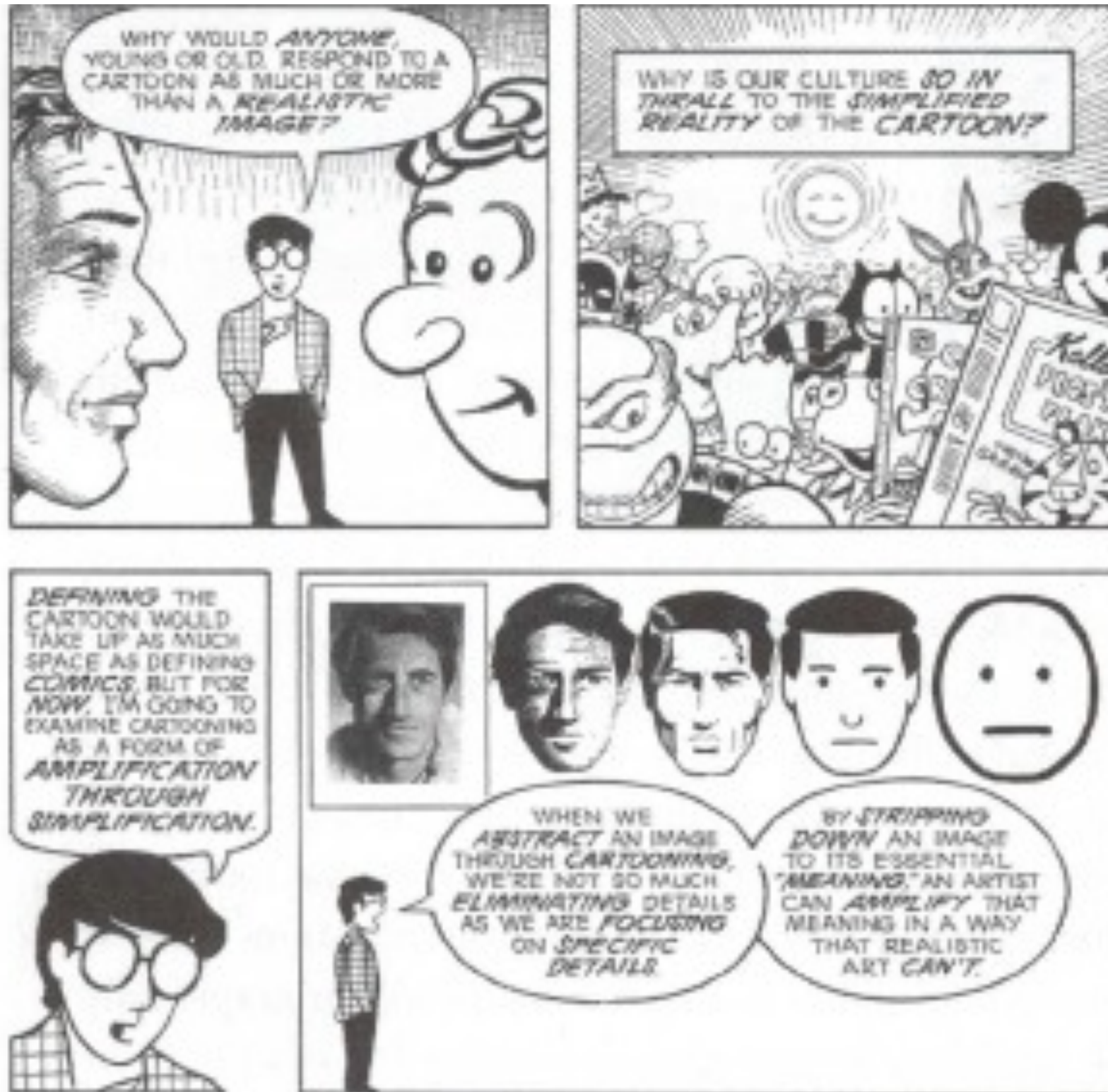


Hybrid sketches

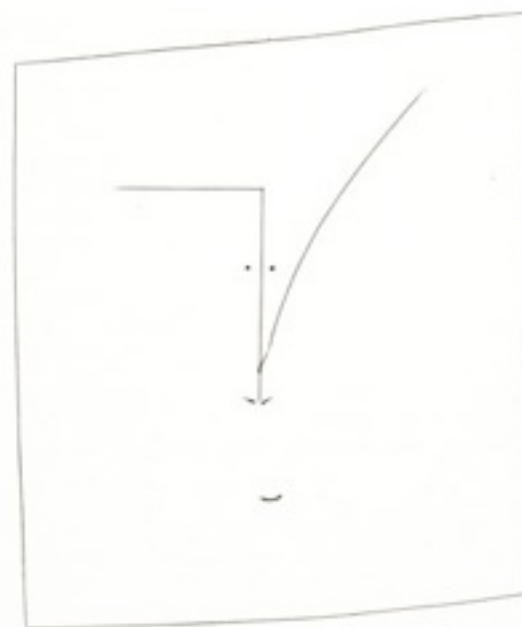


Bill Buxton Sketching User Experiences, Morgan Kaufman Figure 98, p 281

How Much Fidelity Do We Really Need?



Picasso's Engravings for Carmen

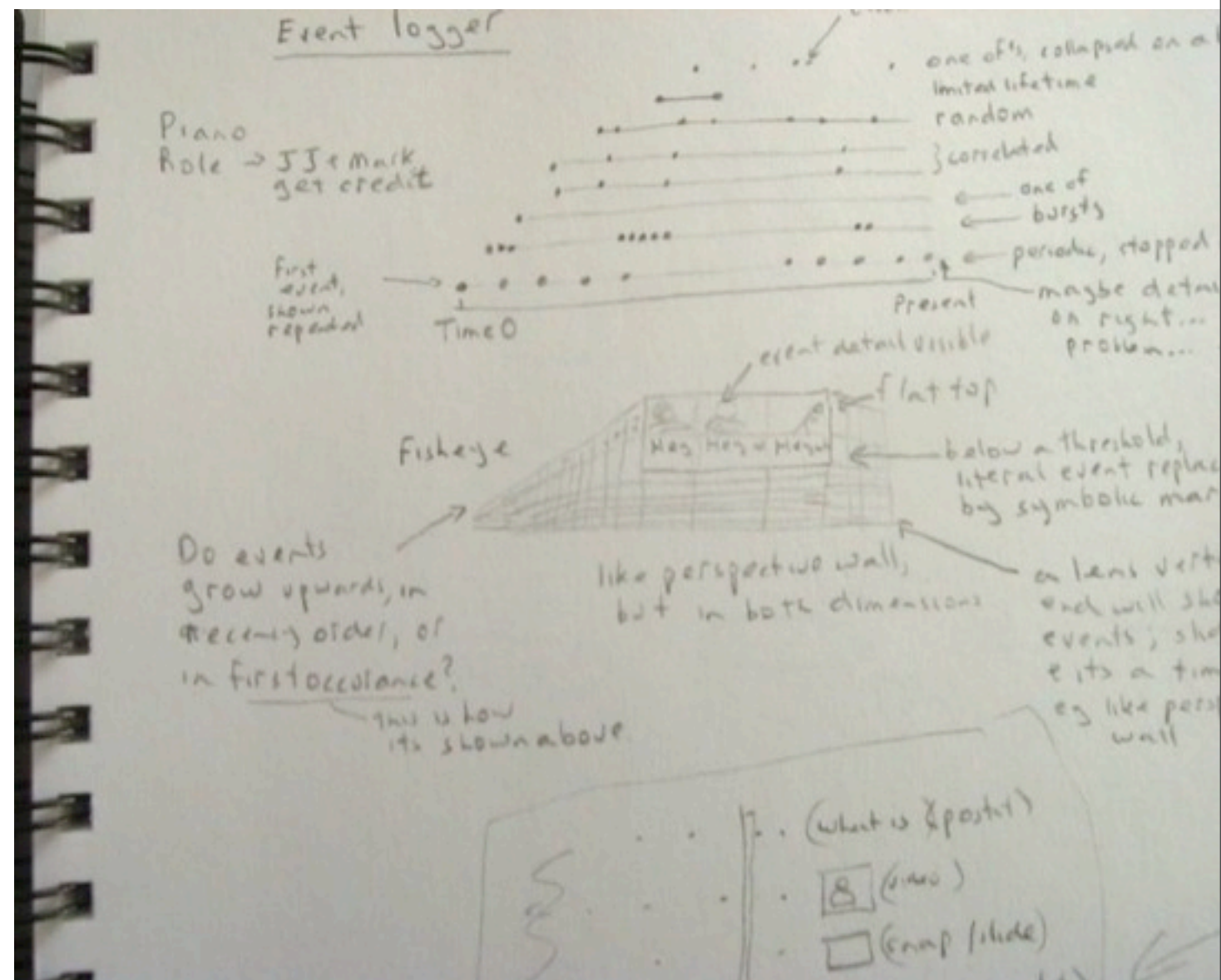


Picasso's Don Quixote



Technique: Annotations

- **Marks** that augment a sketch
 - Directly on sketch
 - As layer
 - Tracing
 - Photoshop layer
 - Over dynamic media

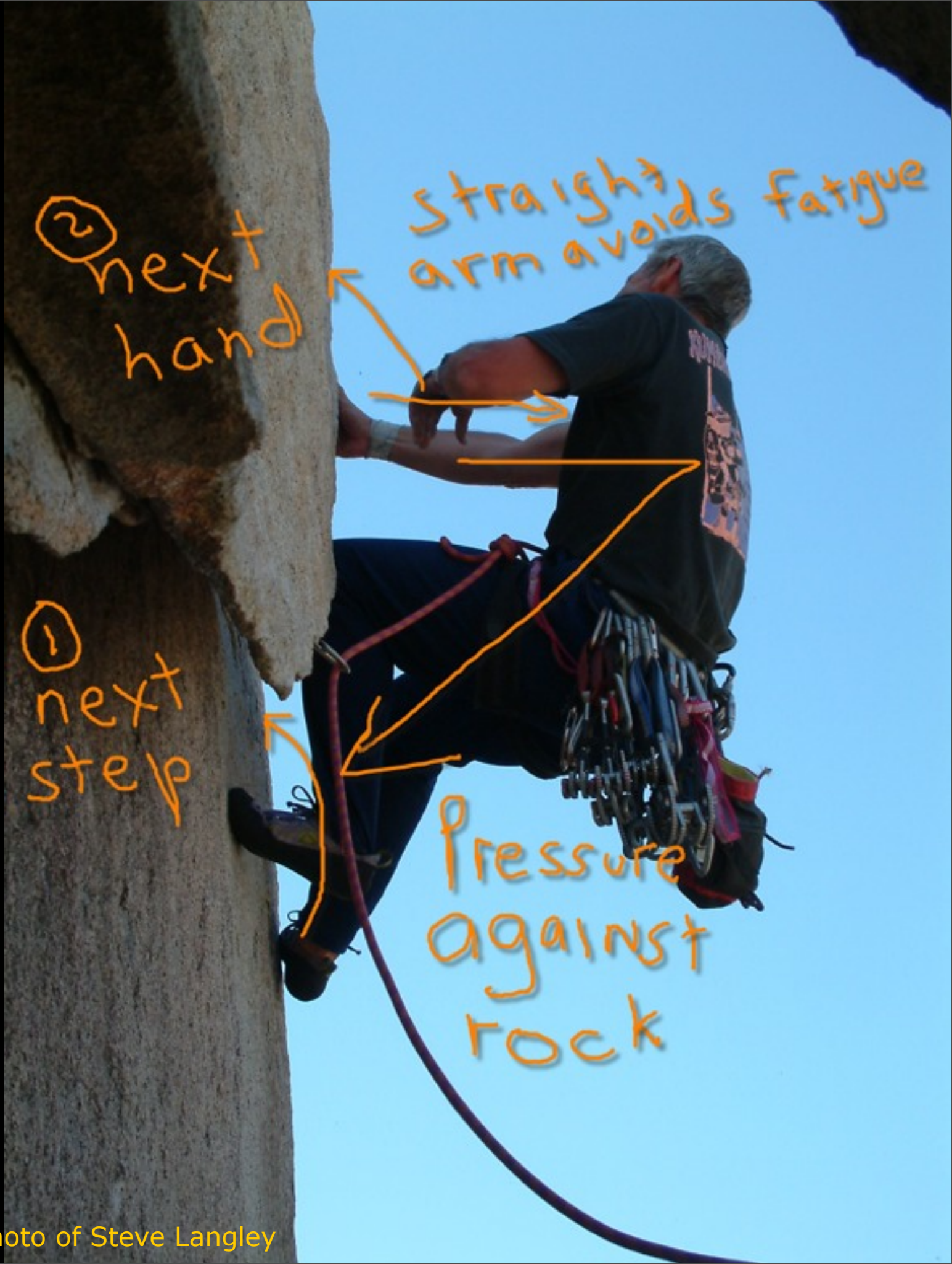


Technique: Annotations

- Textual Notes
 - Name and/or explain things
 - Add detail
 - Lists of items
 - Questions/issues about design...
- Graphical Marks
 - Connects notes to sketch elements
 - Relates sketch elements
 - Show dynamics of elements or interaction over time...



Photo of Steve Langley



② next hand

straight arm avoids fatigue

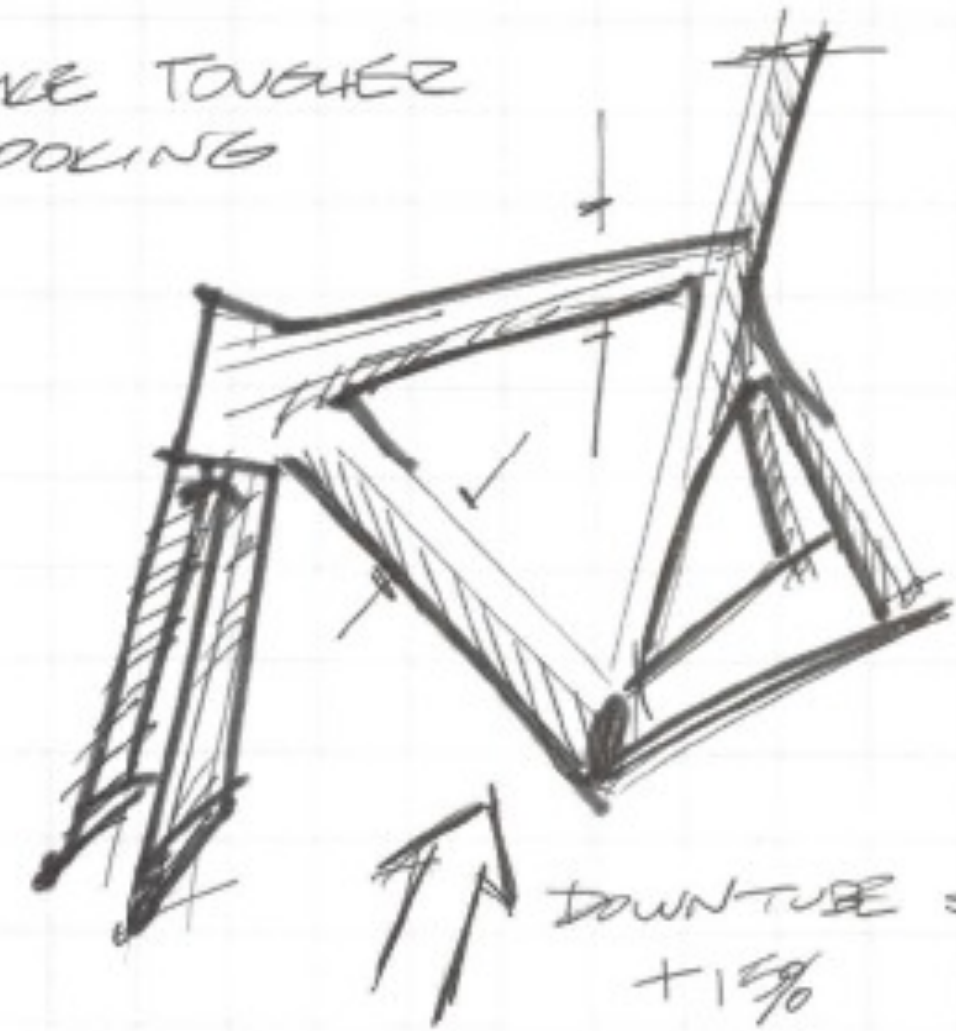
① next step

pressure against rock

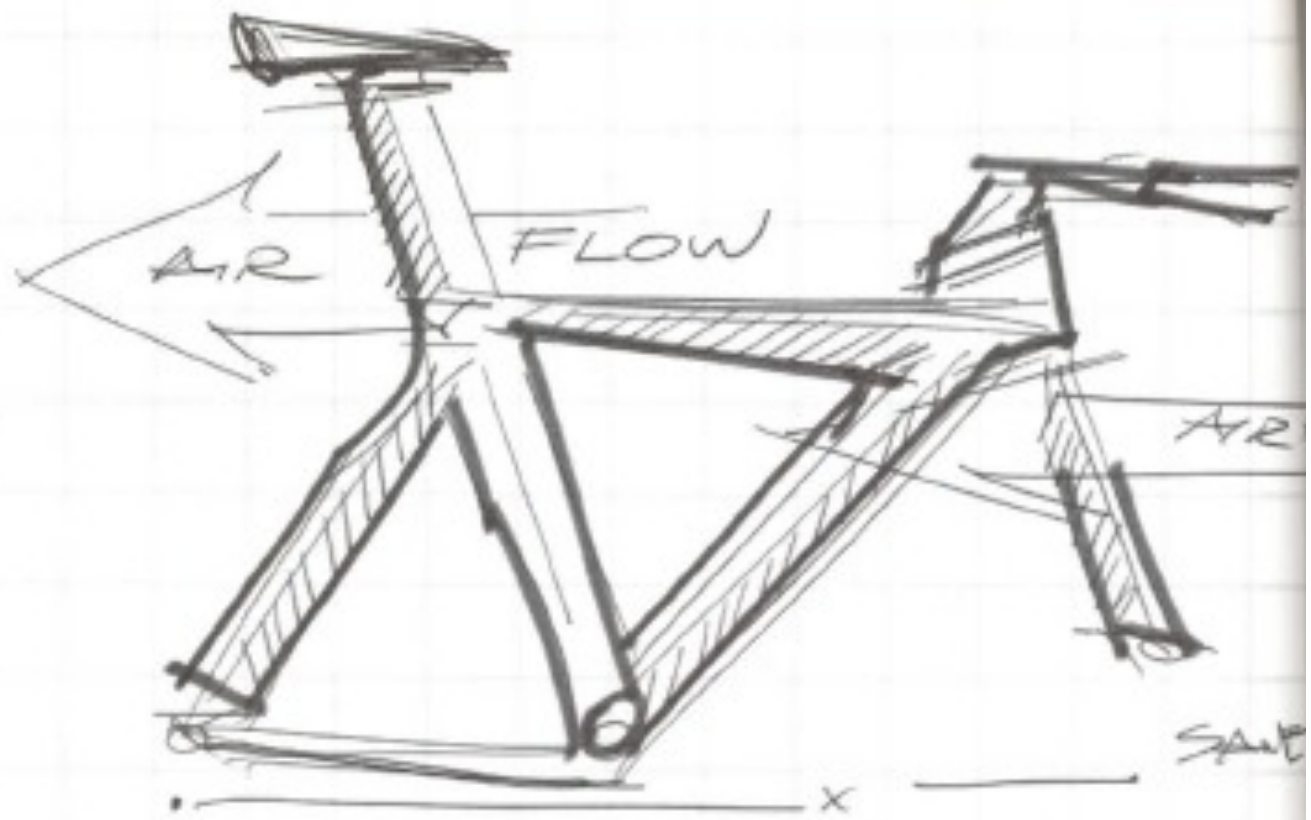
Photo of Steve Langley

TIX THUMBNAIL

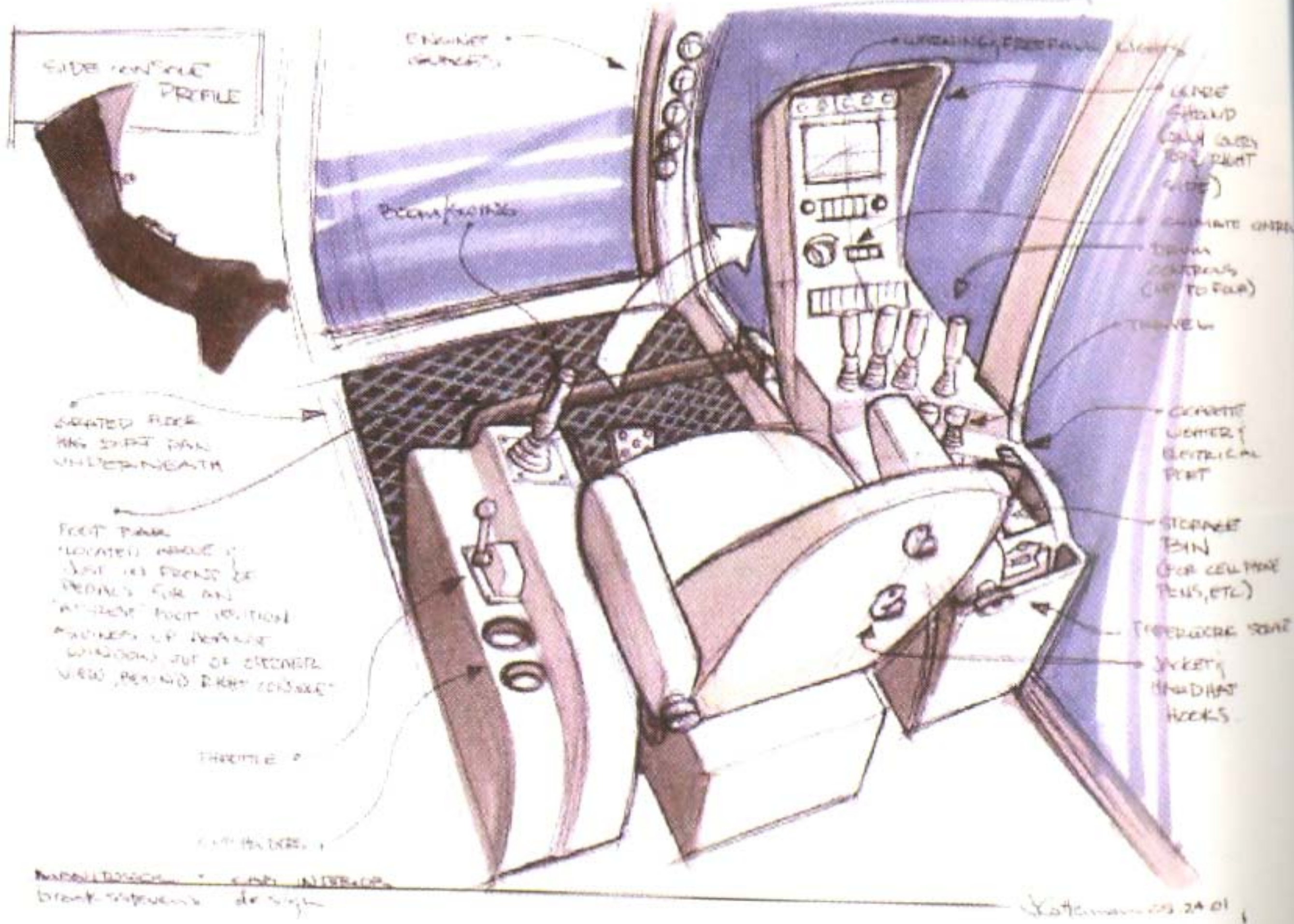
REDUCE DRAG - 10%
INCREASE STIFFNESS
MAKE TOUGHER
LOOKING



↑↑ DOWNTUBE STIFFNESS
+15%



CHANNEL AIR FLOW
- AT TOP TUBE
- ATTACH AT
SEAT STAY



Bill Buxton Sketching User Experiences, Morgan Kaufman Figure 64, p 174

Event logger

Piano
Role → JJ + mark
get credit

First event,
shown
repeated

Time 0

Present

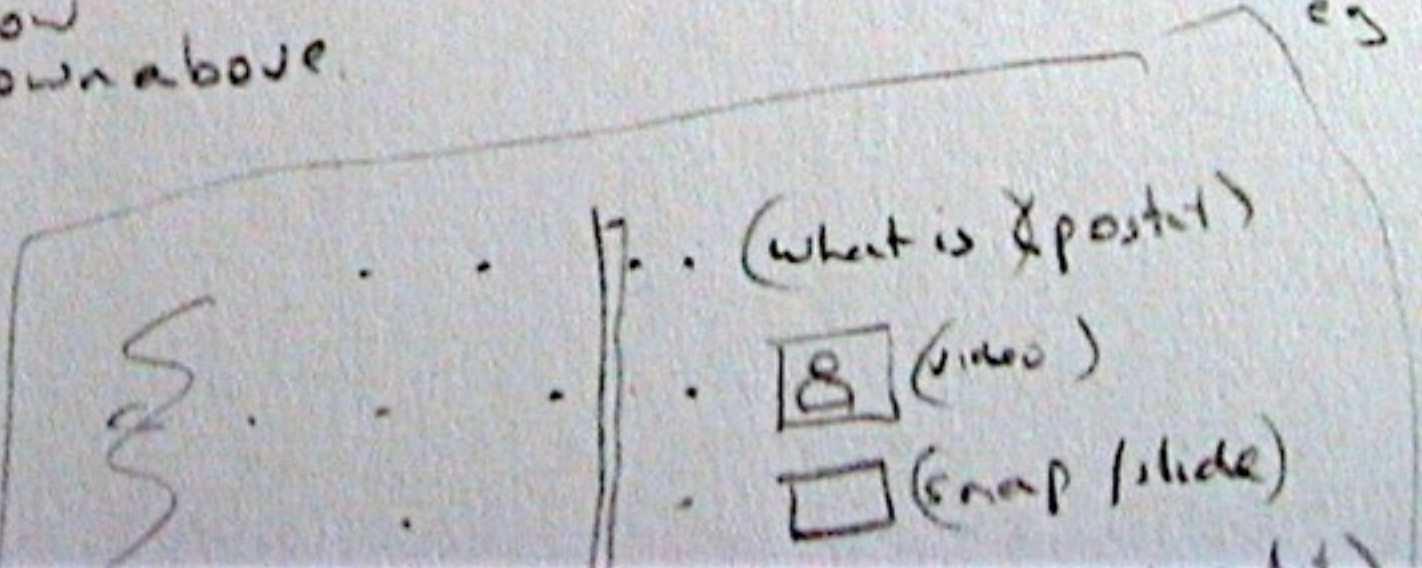
Fisheye

Do events
grow upwards, in
recency order, or
in first occurrence?

— this is how
it's shown above.

like perspective wall,
but in both dimensions

as lens vert
end will show
events; show
it's a time
eg like persp
wall



one of's, collapsed on a
limited lifetime
random

} correlated

← one of
bursts

← periodic, stopped

← maybe details
on right...
problem...

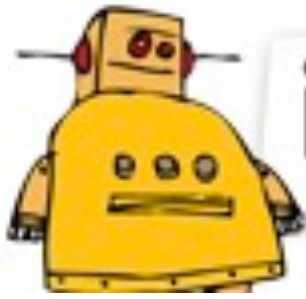
event detail visible

flat top

← below a threshold,
literal event replaced
by symbolic mark

portion of a page from Saul Greenberg's sketchbook





instructables

share what you make

How to Make Playdough (Play-doh)

Basic ingredient ratios:

2 cups flour

2 cups warm water

1 cup salt

2 Tablespoons vegetable oil

1 Tablespoon cream of tartar

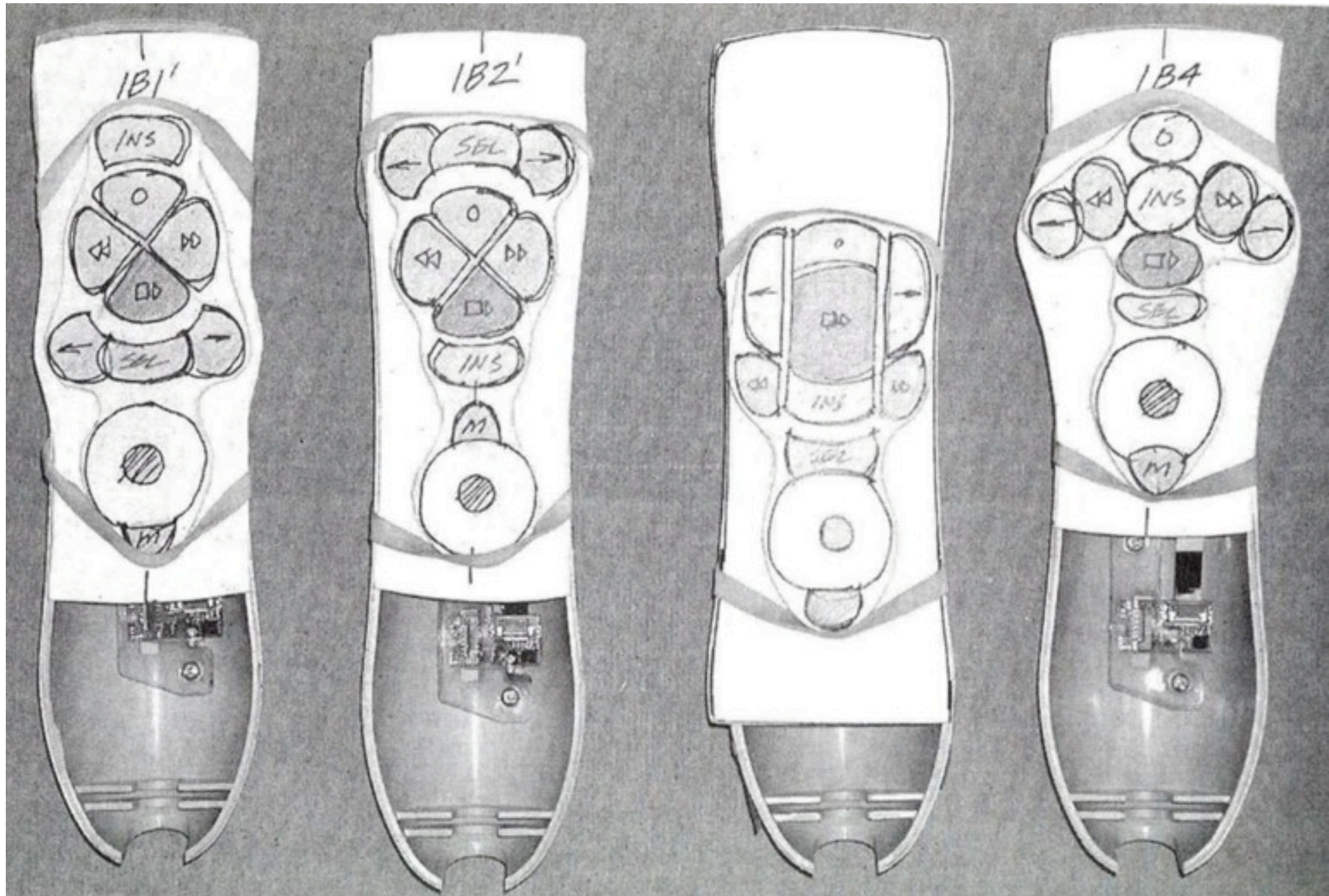
(optional for improved elasticity)



<http://www.instructables.com/id/How-to-Make-Playdough-Play-doh/>



Sketch Examples: Design Variations



¹From Carloyn Snyder's Book Paper Prototyping (2003) Morgan Kaufmann, p350



Wednesday, April 18, 12

Part III: Ubicomp in the Home

based on Geraldine Fitzpatrick's HCI course slides
http://www.informatics.sussex.ac.uk/courses/hci/HCI_lecture10_Dec4_6.pdf

Ubicomp in the Home

- Background
 - Embedded sensors & devices
 - Ubicomp as an *environment*: “the smart home”
- Need to understand
 - **how** people will experience these environments
 - **what** they will want to live with
- Need to situate ubiquitous computing research in the real world
- *Different from office and workplace environments*

Application Areas in the Home

- Home automation and entertainment
- Remote control, energy management
- Capture of experiences
 - Reminder services/lost objects
- Locator services
- Personal communications
- Information filtering: in and out
- Cleaning robots
- Looking after pets

Application Areas in the Home (con't)

- Looking after kids/elders/homebound individuals
- Home diagnostics/health care
- Food tests/alarms
 - Expiration dates, allergies
- Store keeping
- Awareness of consumption/consumables
- Shopping list reminders
- Improved security/safety
- Electronic butler (“Where are my favorite socks?”)

Aware Home Research Initiative

Log in Intranet


AWARE HOME
RESEARCH INITIATIVE

Georgia Institute of Technology

Home ABOUT US PEOPLE PUBLICATIONS RESEARCH SPONSORS NEWS CONTACT US

You are here: Home → ABOUT US

Overview

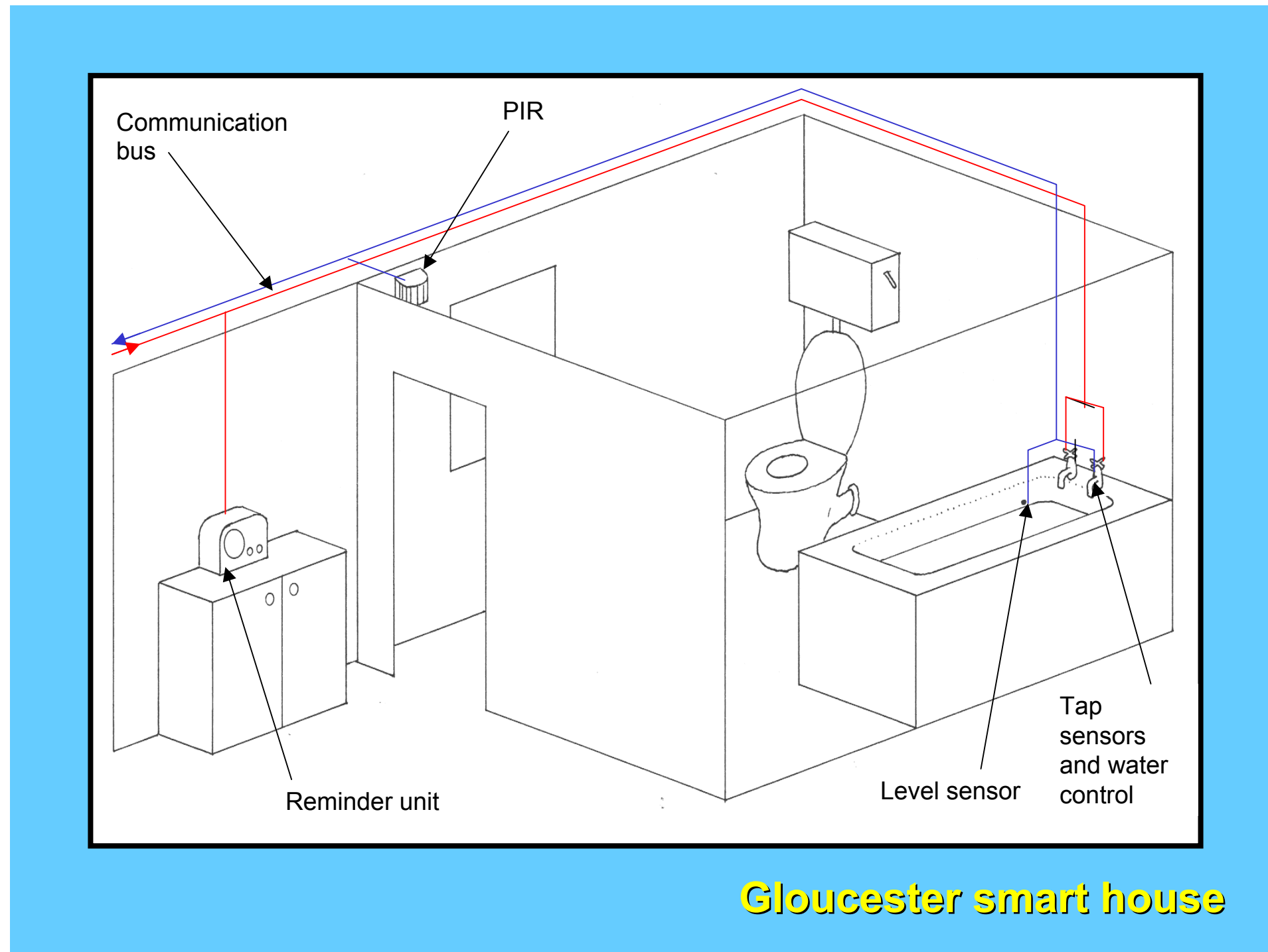


Is it possible to create a home environment that is aware of its occupants whereabouts and activities? If we build such a home, how can it provide services to its residents that enhance their quality of life or help them to maintain independence as they age? The Aware Home Research Initiative (AHRI) is an interdisciplinary research endeavor at Georgia Tech aimed at addressing the fundamental technical, design, and social challenges presented by such questions.

The Aware Home Research Initiative at Georgia Institute of Technology is devoted to the multidisciplinary exploration of emerging technologies and services based in the home. Starting in 1998, our collection of faculty and students has created a unique research facility that allows us to simulate and evaluate user experiences with off-the-shelf and state-of-the-art technologies. With specific expertise in health, education, entertainment and usable security, we are able to apply our research to problems of significant social and economic impact.

New technologies show great promise when applied to the home domain. The opportunities are vast, ranging from new modes of entertainment, services to simplify the management of the home and its myriad activities, and much-needed assistance for individuals at risk and the busy family members who care for them.

Sensors: Bath Smart House Project

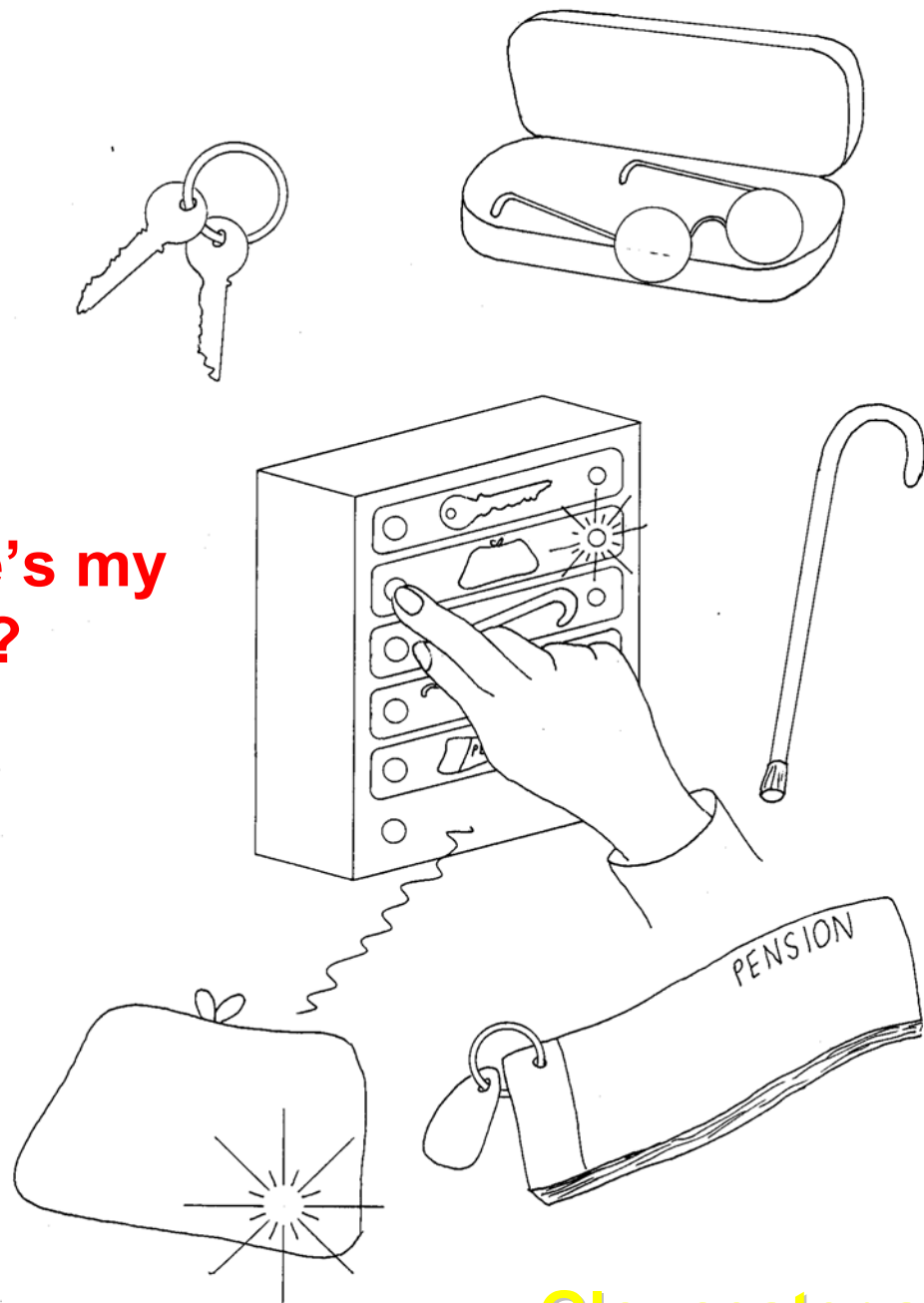


Sensors: Bath Smart House Project

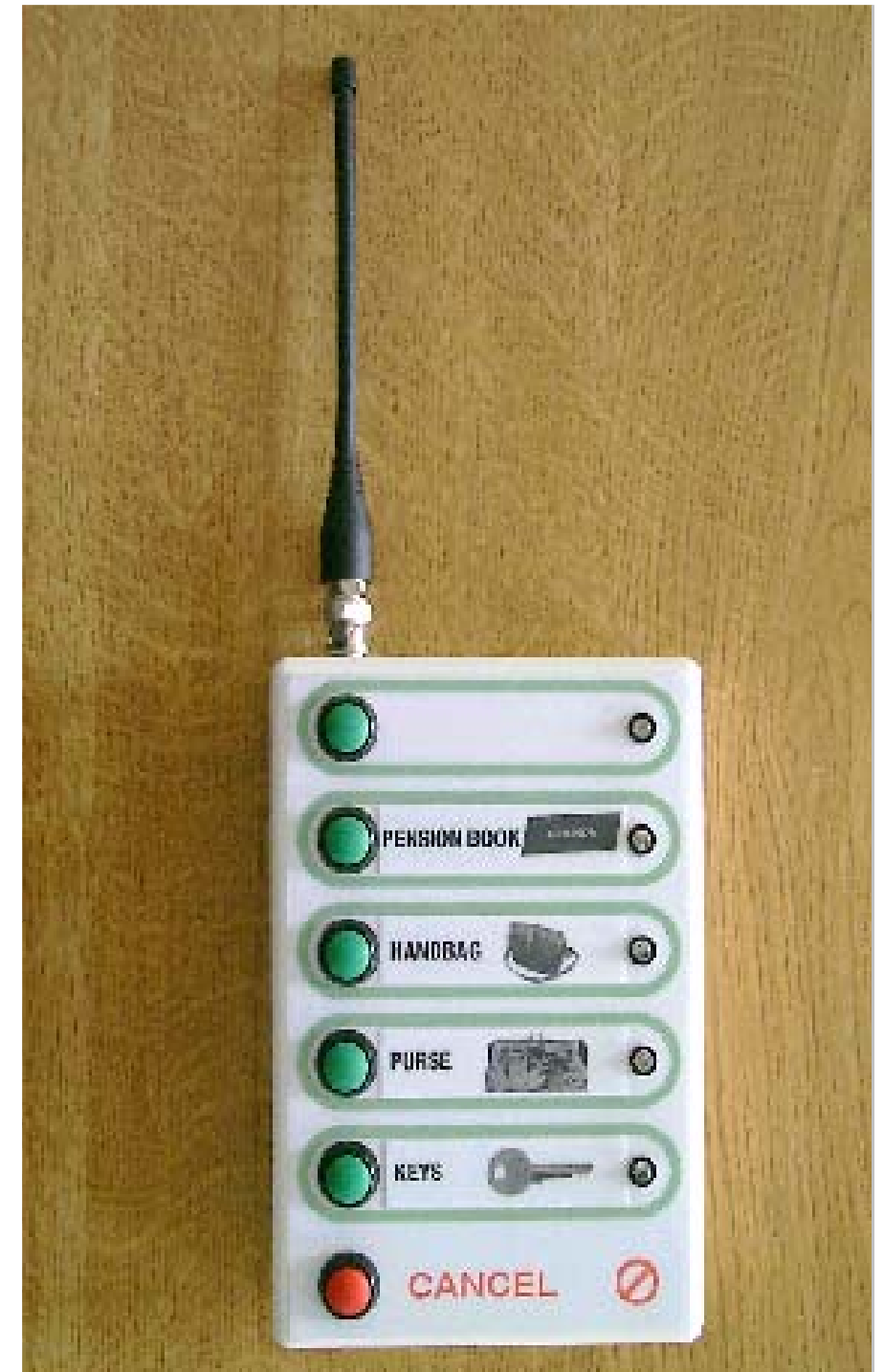


Sensors: Bath Smart House Project

Where's my purse?



Gloucester smart house

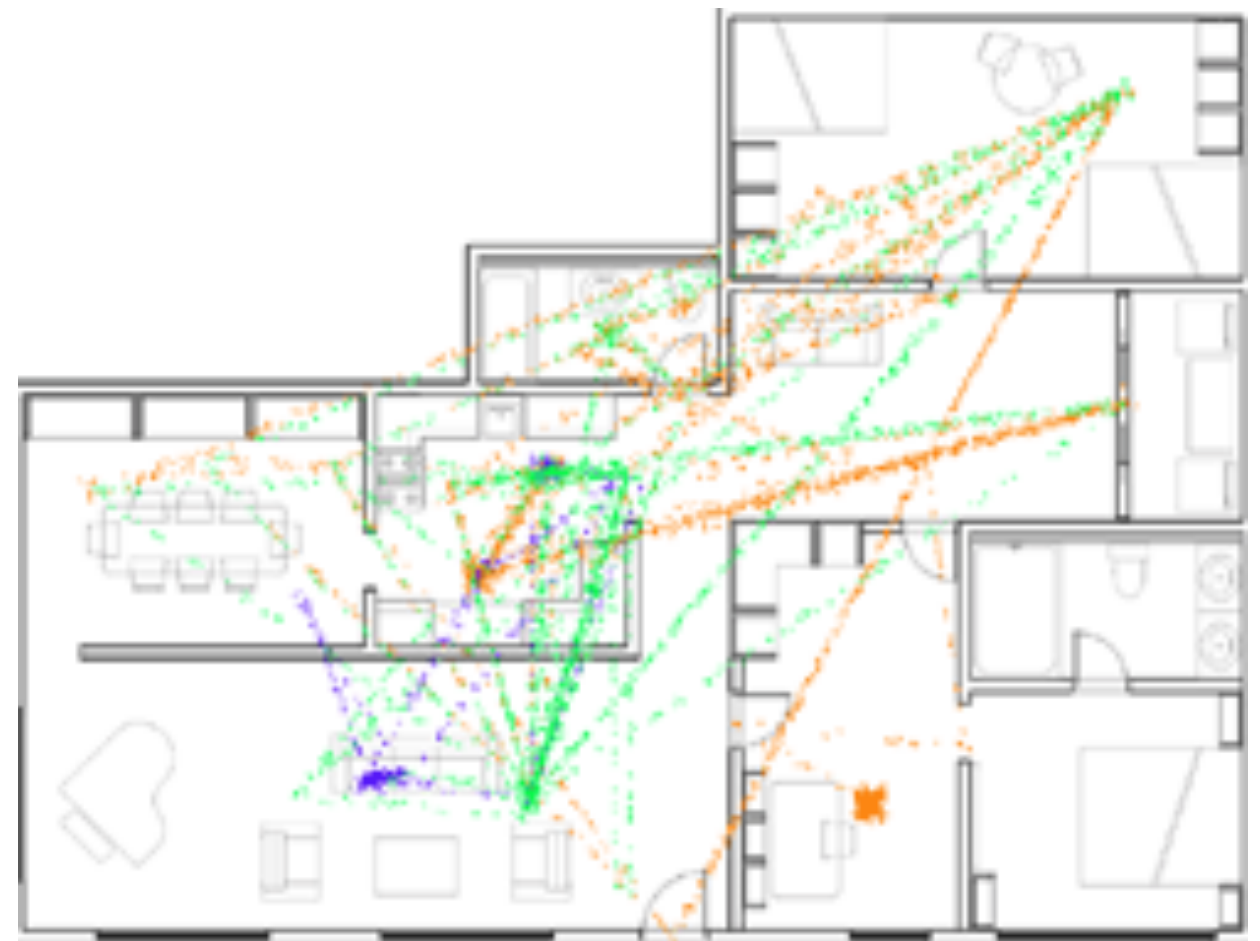
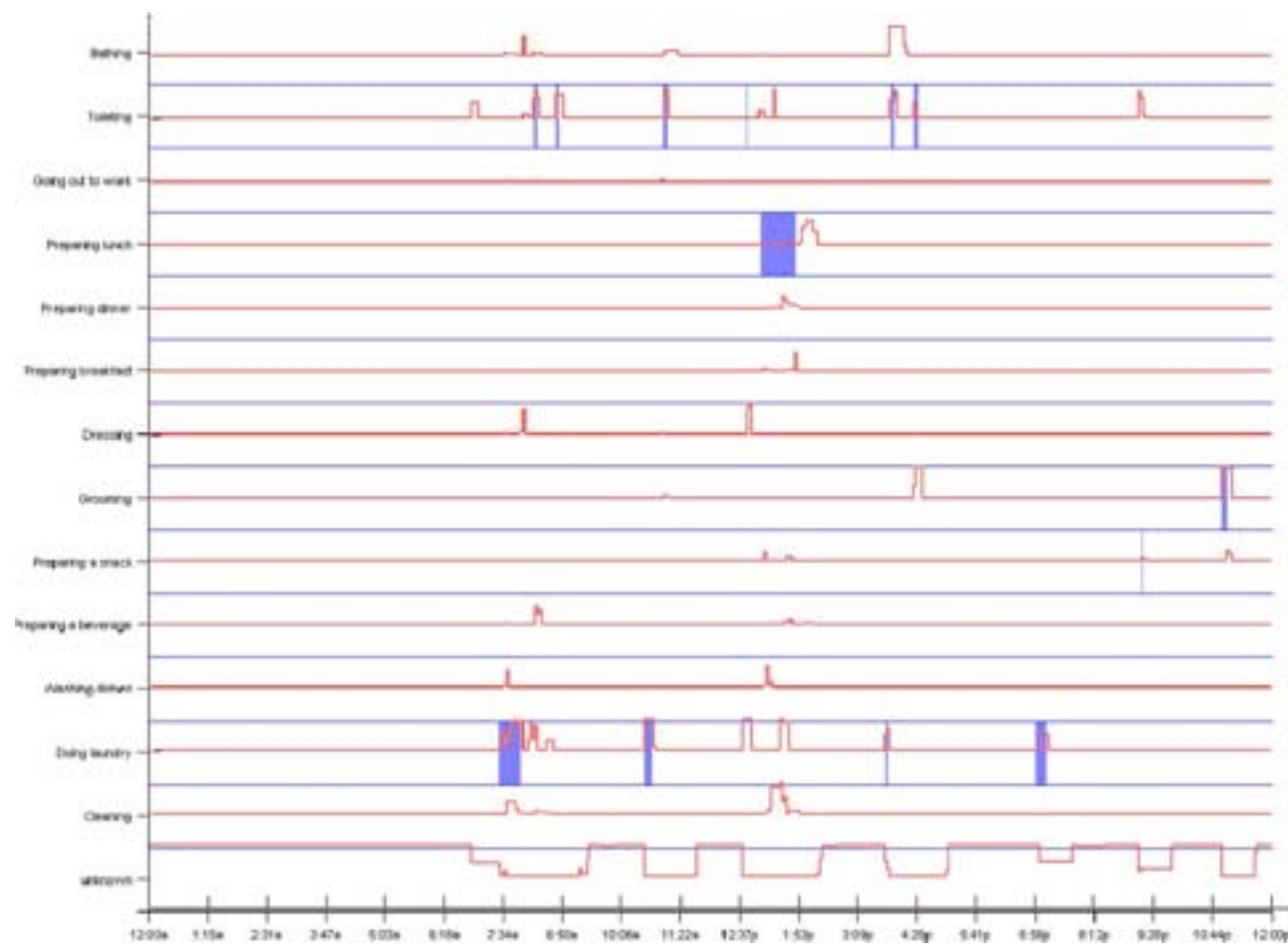


Activity Sensors (MIT House_n)

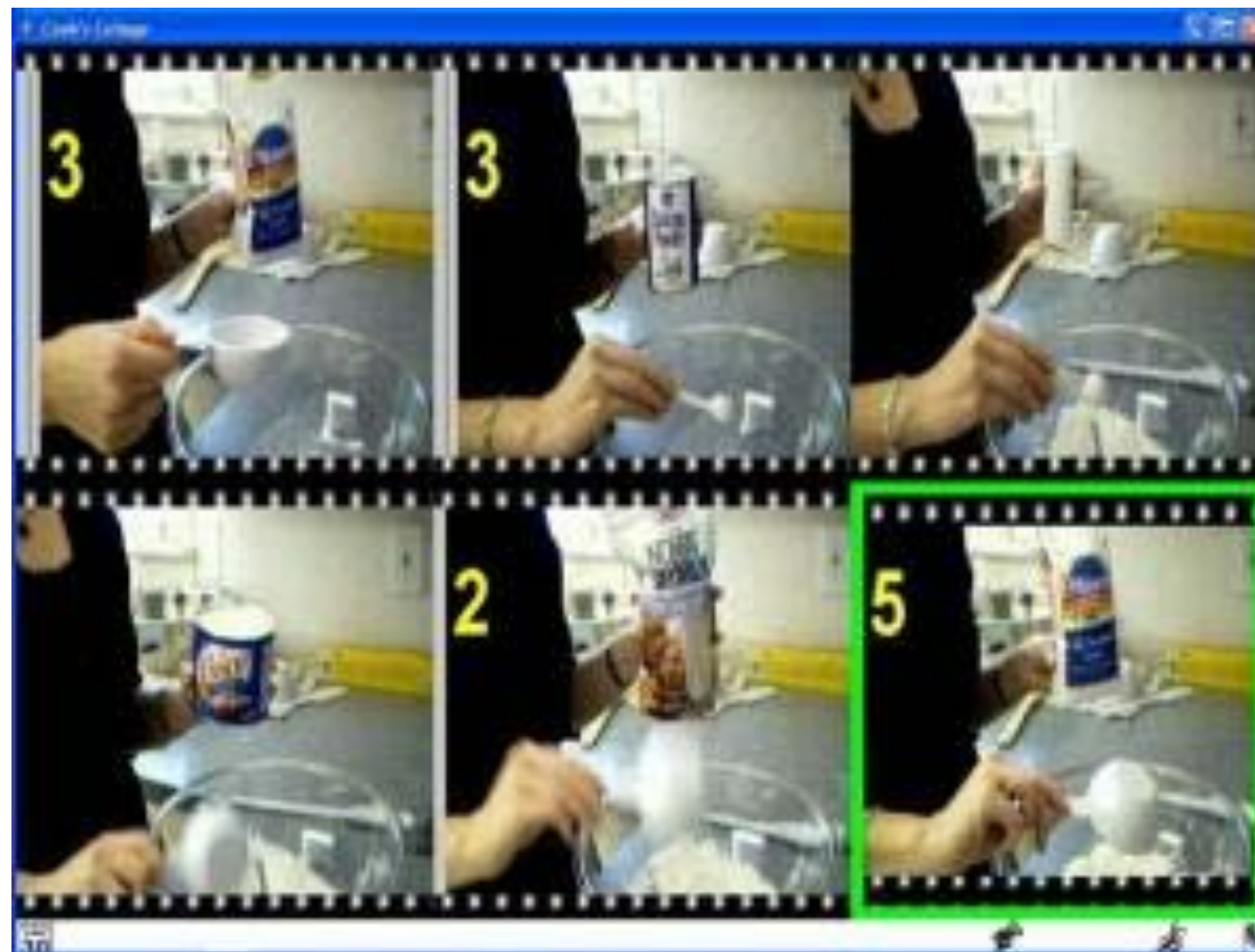
- 77+ sensors/home
 - Monitoring daily living
 - Judging independence
 - Detecting changes in behavior
 - Motivating healthy behavior



Inferring Activities from Sensor Data



Prosthetic Memory Supports



Cook's Collage
*Tran et al.,
Georgia Tech*

Sensing for Remote Carers

Helping family members/“carers” to keep an eye on...



Digital Family Portrait
*Mynatt et al.,
Georgia Tech*



CareNet Display
*Consolvo et al.,
Intel Research*

Communicating with Remote Family Members

Helping remote family members feel connected...



Dude's Magic Box

Rowan et al.,

Georgia Tech



Peek-a-Drawer

Siio et al.,

Georgia Tech/Tamagawa

Aesthetic/Playful Applications



The Drift Table



The History Tablecloth



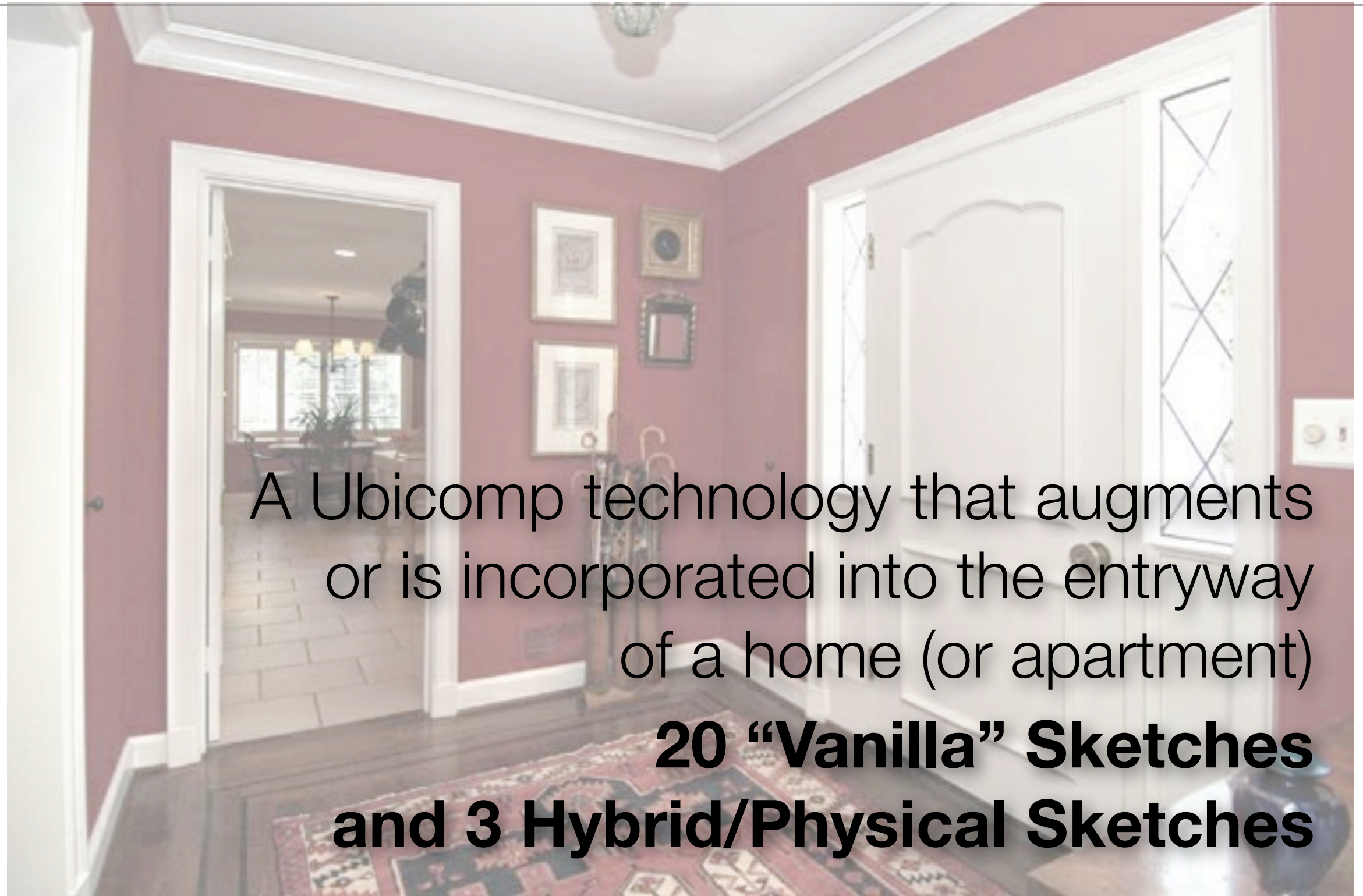
Key Table

Equator Project
Gaver et al.,
RCA/Goldsmiths College

Impediments/Open Questions

- Cost
- Technical feasibility
- Complexity — “home administrators?”
- The need for technology is not seen as contributing to a better life
- Privacy and security concerns
- Recording everything will fundamentally change our lives (and not necessarily in a good way)

YOUR EXERCISE FOR THIS WEEK



A Ubicomp technology that augments or is incorporated into the entryway of a home (or apartment)

**20 “Vanilla” Sketches
and 3 Hybrid/Physical Sketches**

Next Week

- Hybrid Sketching + Home Assignment **Due**
(20 Sketches + 3 Hybrid Prototypes)
- Initial Design Crits
- The Visual Narrative (Storyboards)
- Intro to Augmented Reality systems
- Bring: sketchbook, drawing tools
- Due this week:
 - Group project overview reports (**by Wed., 5pm**)
- *Don't forget your readings!*