CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 01:
Introduction and
Personal Informatics

James Fogarty
Alex Fiannaca
Lauren Milne
Saba Kawas
Kelsey Munsell

Tuesday/Thursday
12:00 to 1:20

What Is This Course?

Time for a Door Quiz:

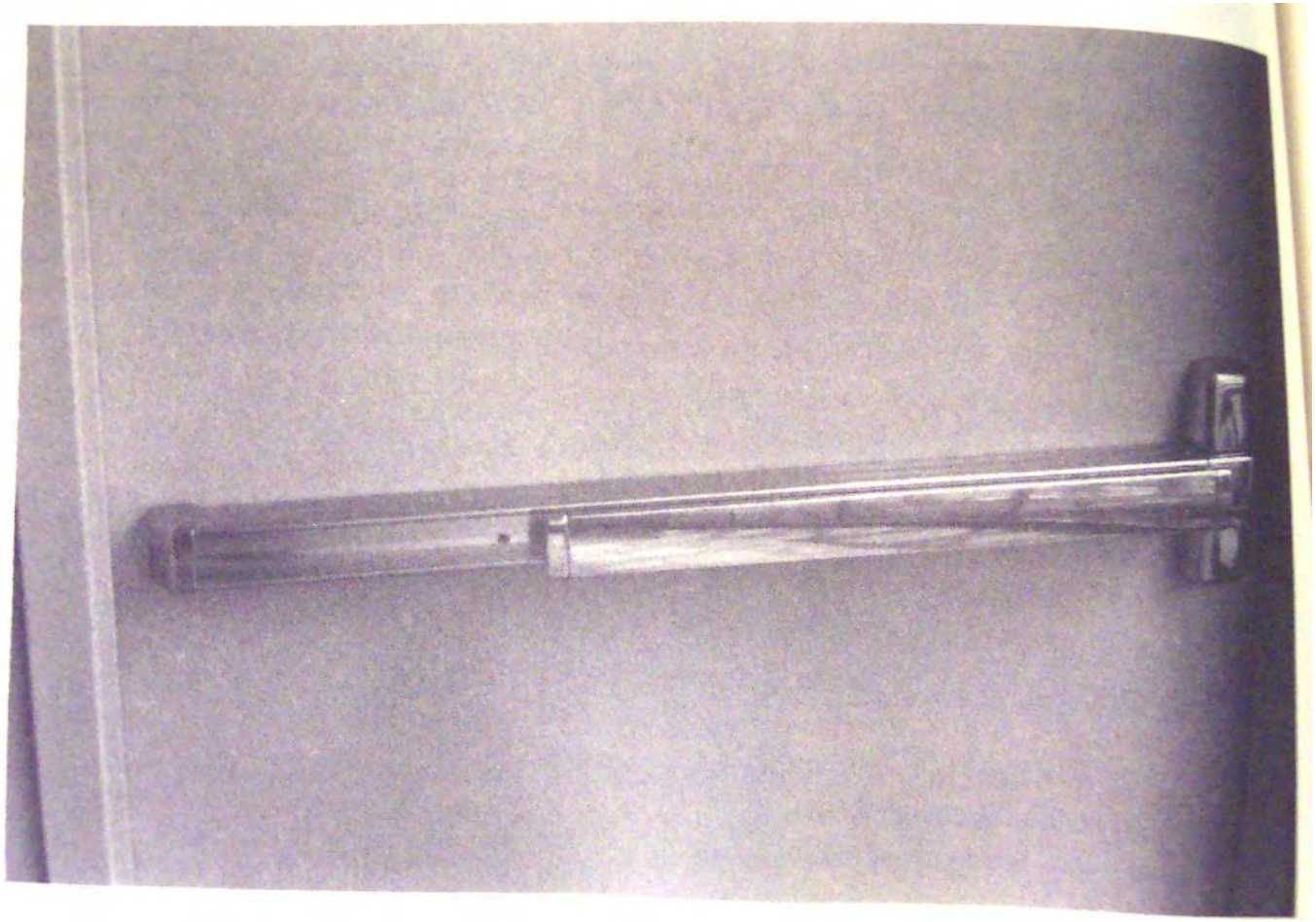
Say out loud what action you use to open the door

Push

Pull

Door Quiz

Door Quiz



Door Quiz

Door Quiz

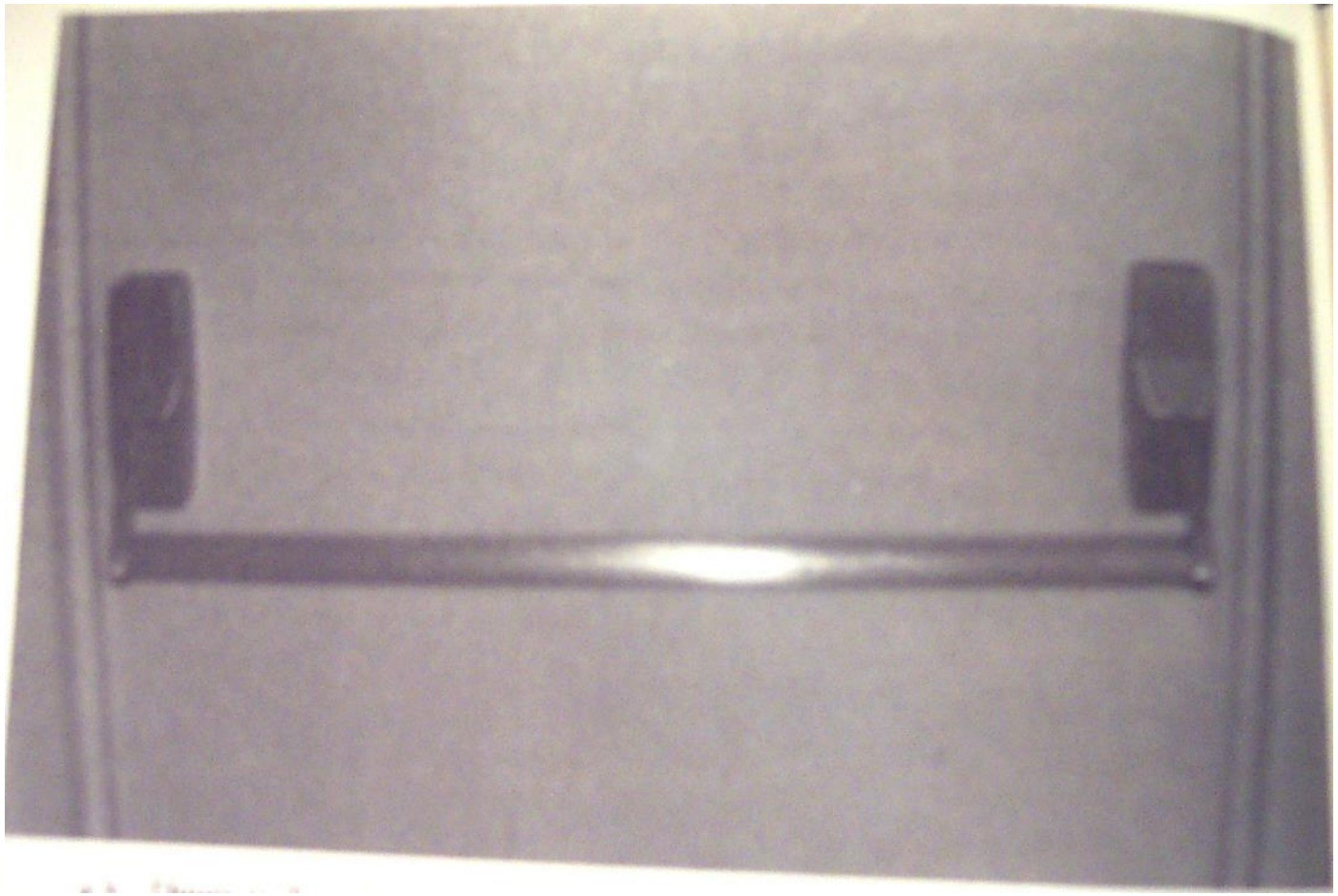
Door Quiz

Door Quiz

Door Quiz


PUSH
You can HAVE IT YOUR WAY® and pull it if you want, but this hinge is pretty stubborn.
AMERICAN EXPRESS
Pull
BURGER KING

Door Quiz

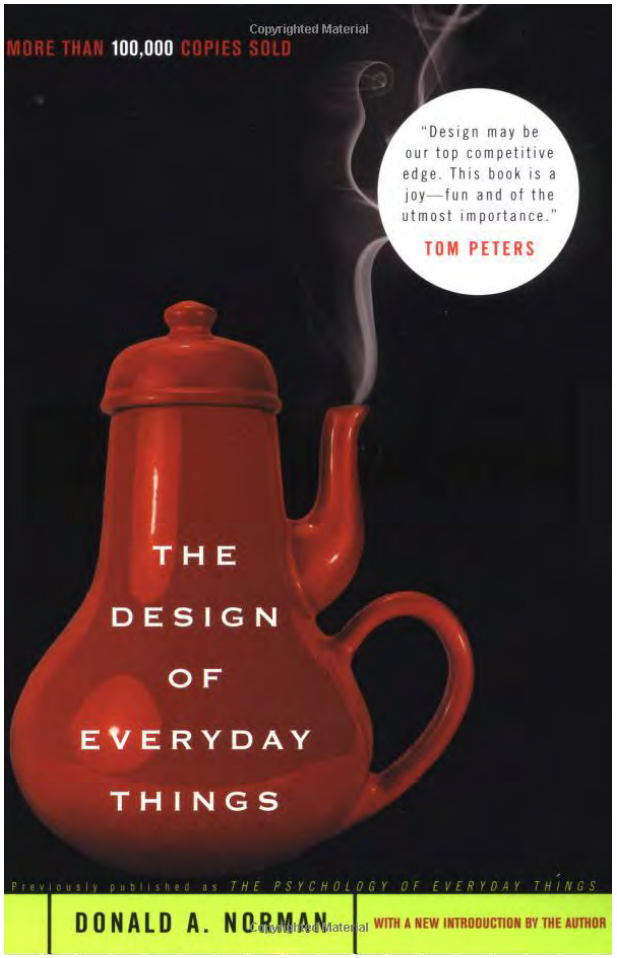


Door Quiz

What is so Special about Computers?

Nothing! It is about good designs and bad designs

- We all make push/pull decisions many times per day
- We all encounter doors that do this badly
- We all see signs that do not change what we do



What is so Special about Computers?

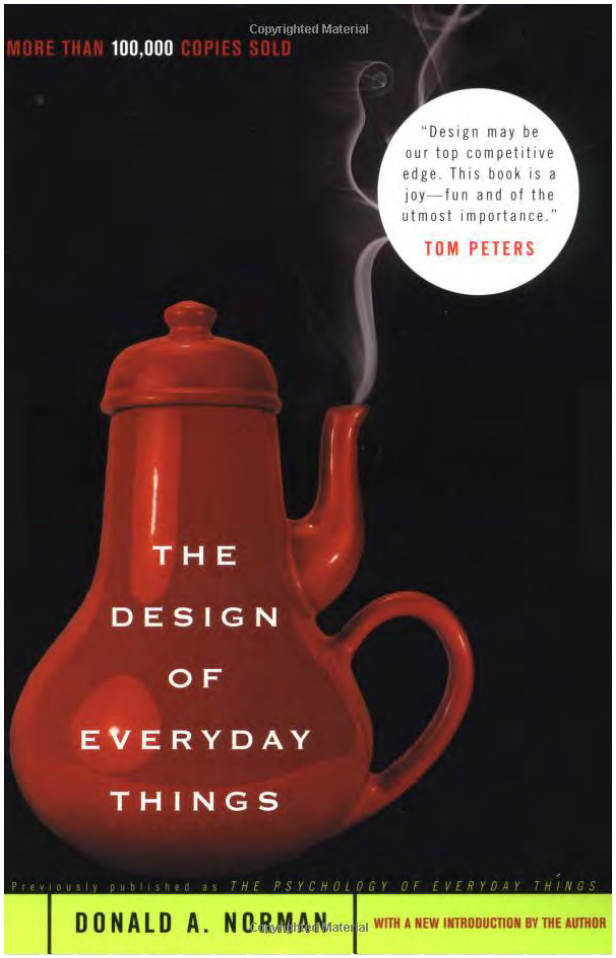
Yet we blame ourselves

Absolutely everything we encounter in the made world was designed

- Too often poorly designed

Read this book

- Be warned you cannot unread it, you become angry



Iterative Human-Centered Design

This is a course about process

This is not a course about ‘good’ interfaces or rules that you should follow in design

Rapid iteration and exploration is the most important and effective tool for effective design

> “Enlightened trial and error succeeds over the planning of the lone genius” – Peter Skillman, IDEO

Project Overview

The core of this course is a group project

Propose and do an intense end-to-end design

- Getting the Right Design
- Getting the Design Right
- Communicating the Design

Not an implementation course

StoneSoup

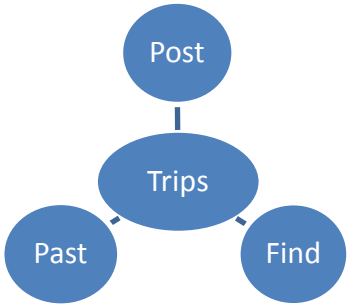
Contextual Inquiry & Task Analysis

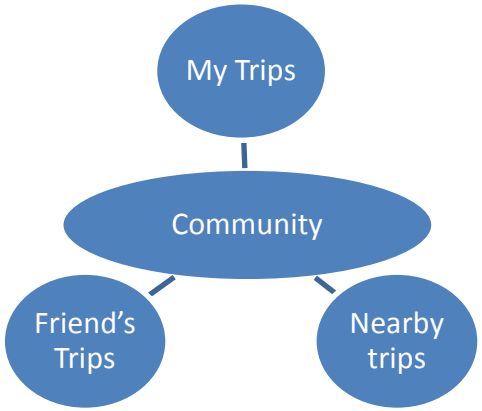
Observe practices and understand needs

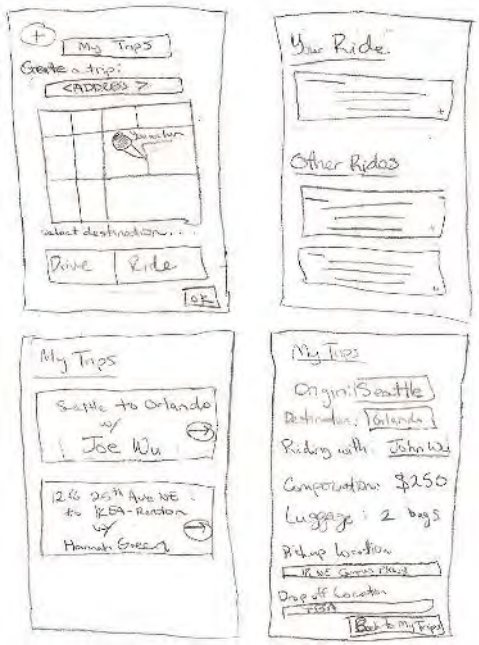
Consumester

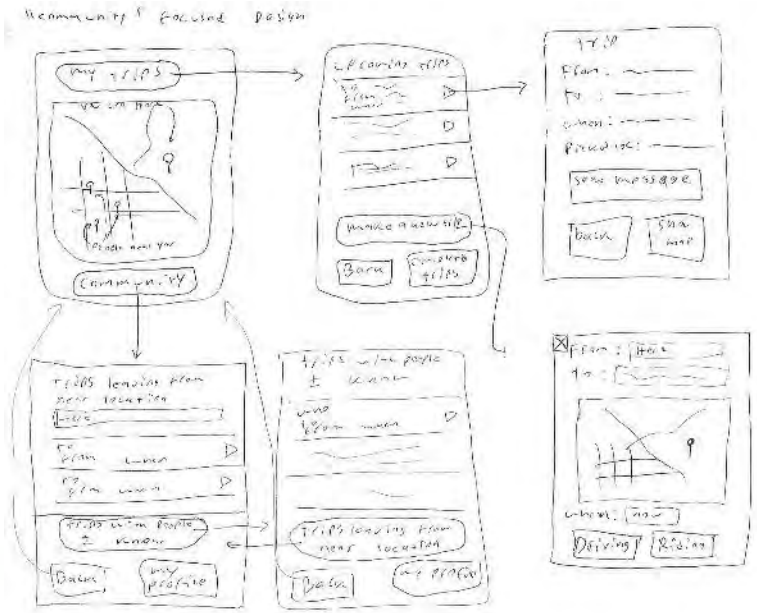
FoodWatch

Sketching & Storyboarding



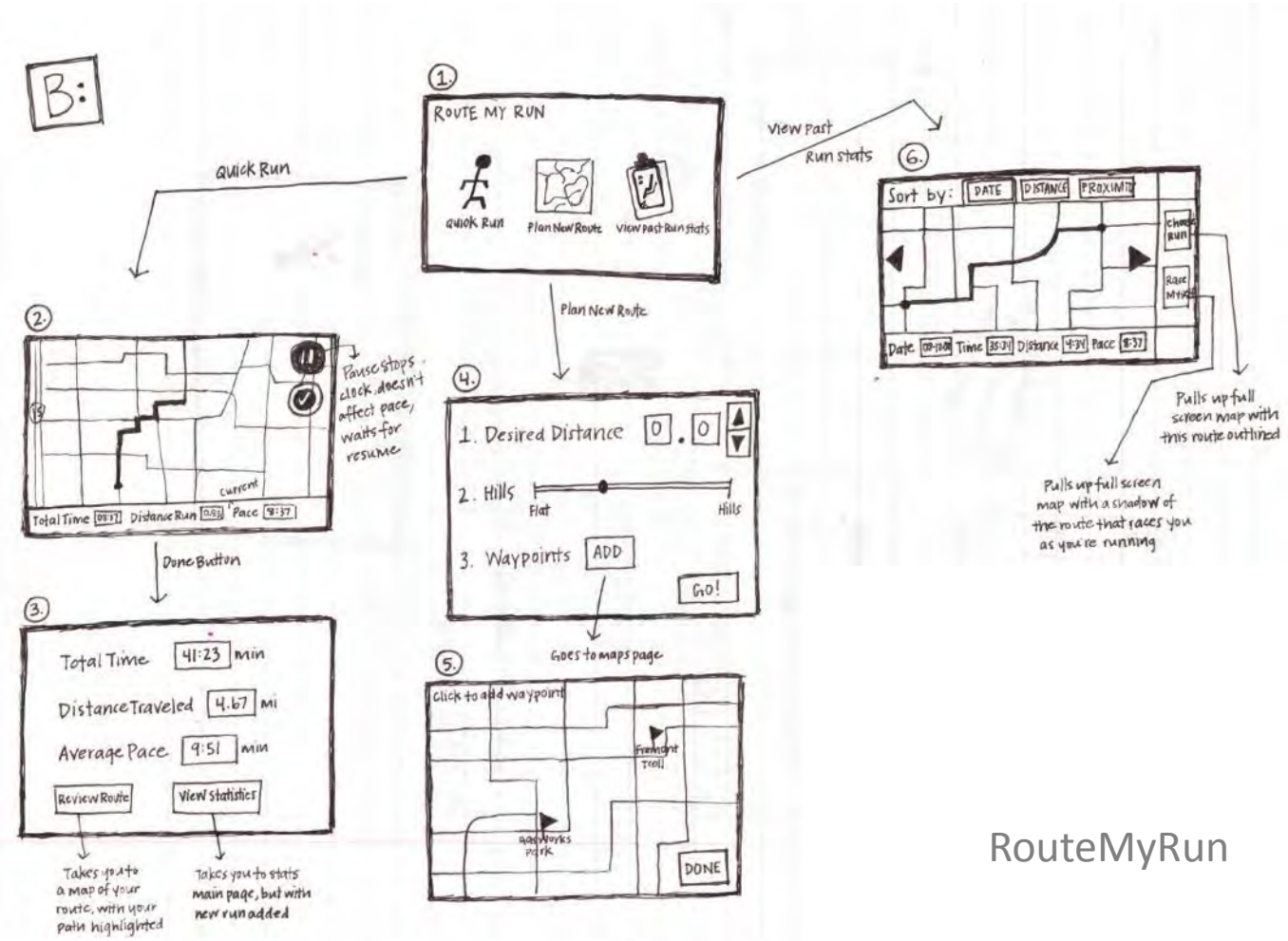






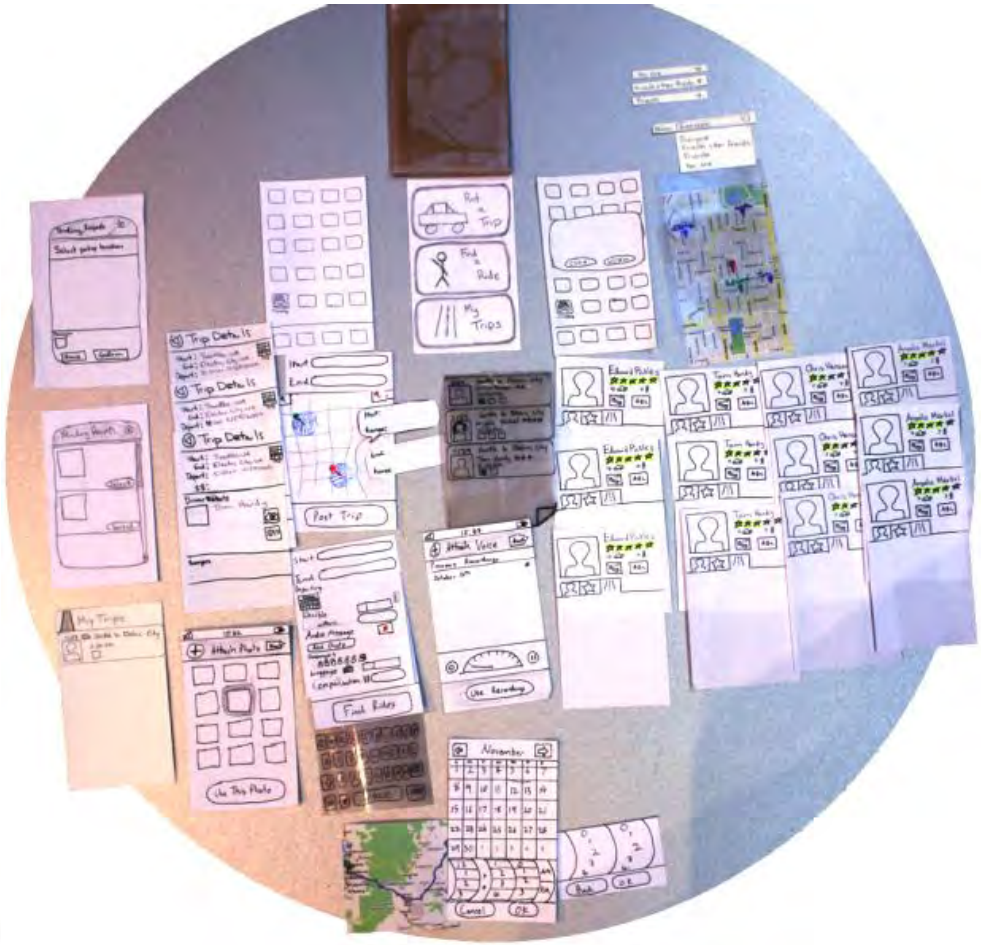
RideAlong

Sketching & Storyboarding



RouteMyRun

Low-Fidelity Prototyping & Testing



RideAlong

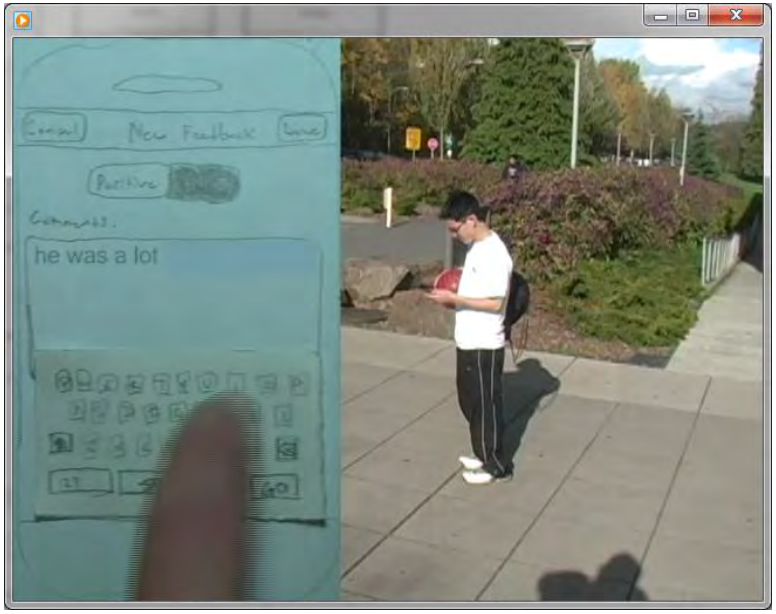
Digital Mockup

Fitter

.calm

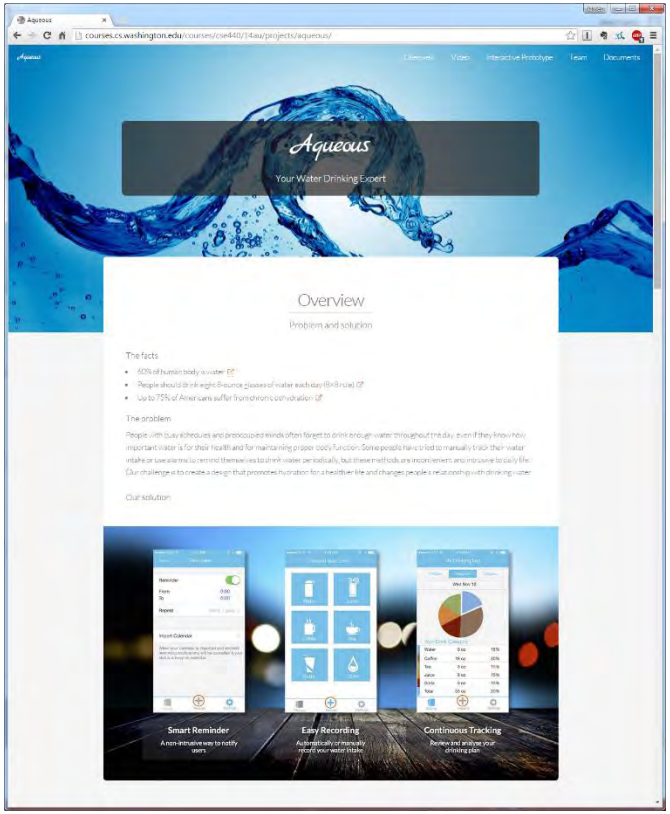
Video Prototypes

GetOut



PickUp

Learn by Example from Prior Projects



Aqueous:

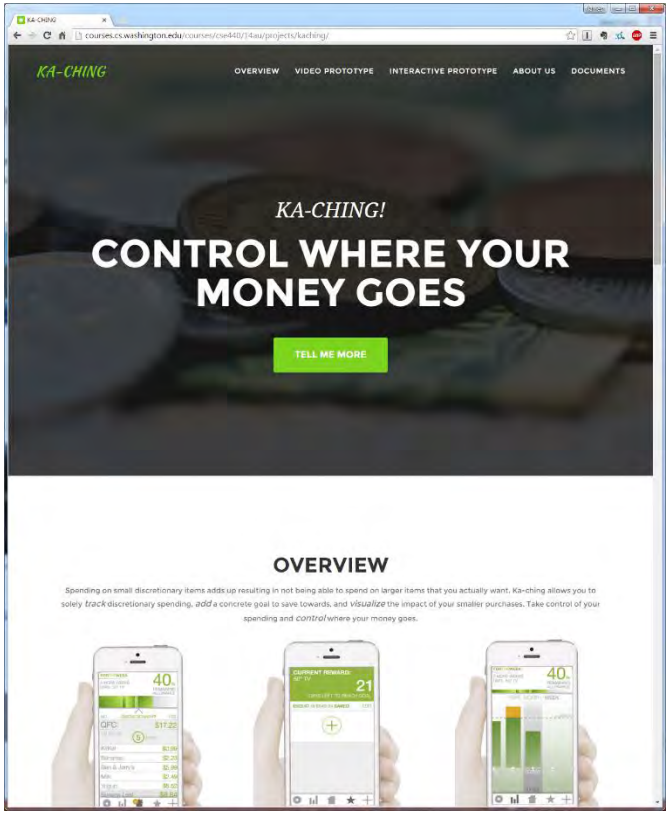
https://courses.cs.washington.edu/courses/cse440/14au/projects/aqueous/

Learn by Example from Prior Projects

IEP Connect:

https://courses.cs.washington.edu/courses/cse440/14au/projects/iepconnect/

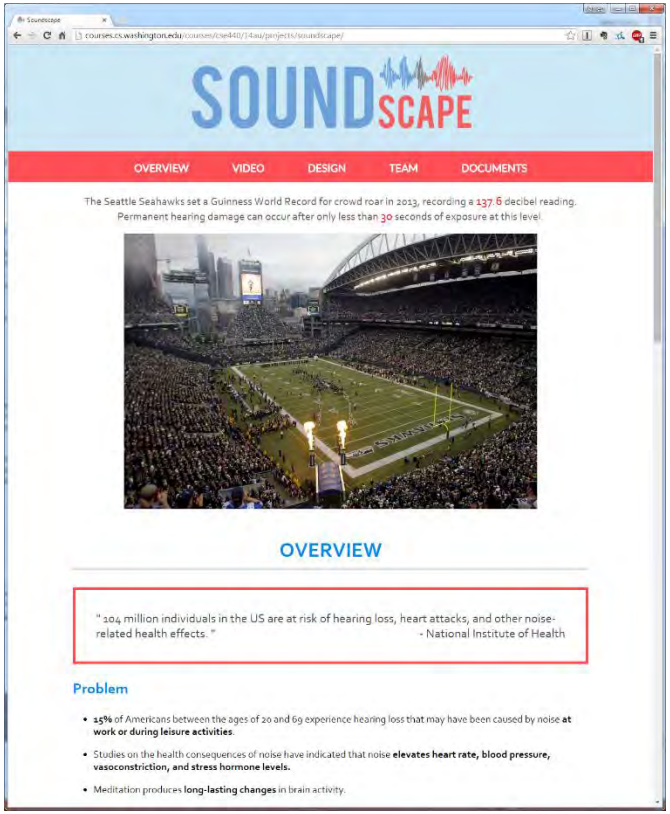
Learn by Example from Prior Projects



Ka-Ching:

https://courses.cs.washington.edu/courses/cse440/14au/projects/kaching/

Learn by Example from Prior Projects



Soundscape:

https://courses.cs.washington.edu/courses/cse440/14au/projects/soundscape/

Studio Time in Section and Lecture

This course is designed around rapid feedback

Section is primarily studio time with the staff

- Groups will be formed within section
- Your team will always bring a product to studio
- Participation is a critical component of the course

Many in-class exercises scheduled for Tuesdays

- Participation is a critical component of the course

Overview

HCI and the Project Sequence

Course Staff Introductions

Administrivia

Assignment 1: Project Proposal

- Assignment 1a: Due Tonight
- Assignment 1b: Due Tuesday

Some Reflection

Self-Tracking and Relevant Background

Who We Are

James Fogarty

- BS, Virginia Tech, 2000
- PhD, Carnegie Mellon, 2006
- Joined UW CSE, 2006

Brief Industrial Stints

- IBM, 2000
- IBM Research, 2003
- Microsoft Research, 2007

Who We Are

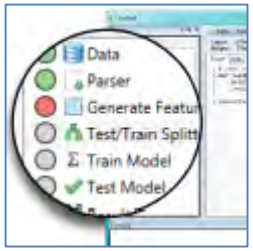
Cross-Campus HCI Efforts

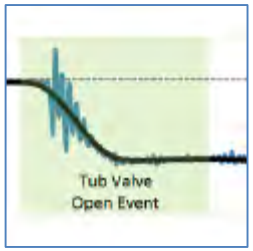
- DUB
- MHCID

Teaching

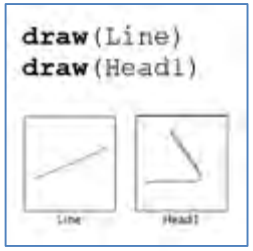
- CSE 440: Introduction to HCI
- CSE 441: Advanced HCI
- CSE 510: Advanced Topics in HCI
- CSEP 510: Human-Computer Interaction
- CSE 332: Data Structures

Who We Are

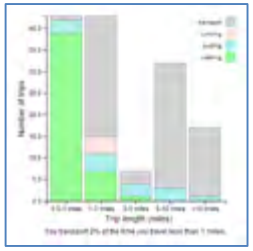

Data
Parser
Test/Train Split
Train Model
Test Model

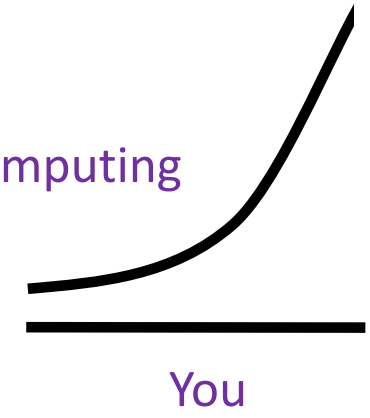

Tub Valve
Open Event


110
Drag


draw(Line)
draw(Head1)
Line
Head1


Dark Green/Orange Veg
Veg
Whole Grains
Grains
Fruit




Computing
You

Who We Are

Alex Fiannaca

BS, Biochemistry and Molecular Biology
University of Nevada, Reno, 2012

MS, Computer Science & Engineering
University of Nevada, Reno, 2014

Research:

HCI and accessibility, specifically accessible technologies for people with motor impairments, alternative input modality

Interests:

Web development, reading, exploring different cuisines, backpacking (favorites including Yosemite and Tahoe Rim)

Who We Are

Lauren Milne

BA, Physics
Carleton College, 2008

Research:

Accessibility, specifically making charts and graphs more accessible people who are blind

Interests:

Triathlons, skijors with her two dogs,
reads mystery novels and science fiction

Who We Are

Saba Kawas

BS, Architectural Engineering
University of Jordan, 2005

MA+D, Computer Graphics and Animation
North Carolina State University, 2009

MS, Human Centered Design & Engineering
University of Washington, 2016

Interests:

Argentine Tango, experimental cooking, foreign films, walking with birds of prey (i.e., falconry)

Who We Are

Kelsey Munsell

BA, Mass Communication &
BA, Organizational Communication
Montana State Billings University, 2014

MS, Human Centered Design & Engineering
University of Washington, 2016

Contracting with Bungie, Inc. as User Research Assistant

Interests:

Yoga, gaming, enjoying musicals downtown,
discussing communication theory

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Staying in Touch

Web:	http://www.cs.washington.edu/440
	You are responsible for calendar
Email Us:	cse440-instr [at] cs.washington.edu
Email:	You are responsible for course email
Office Hours:	Posted on Calendar
	Also By Appointment

GitHub Repository

The website, assignments, and other materials are being run from a GitHub repository

https://github.com/uwcse440/web-cse440-au15

You will contribute when posting your projects

You can and should contribute when you see the opportunity

Grading

We provide a grading scale, but it is subjective

- Design is subjective, and so is this course
- Wow us with your work, not with complaining

Entire project process is designed for feedback

- Milestone grades mean you did the milestone
- You still must act on feedback as part of continuing to refine and develop your project
- A focus on “doing the work” and “getting feedback” means final grades are more “quality of result”

Grading

Group Project: 65%

- Assignment 1: 3%
- Assignment 2: Getting the Right Design: 21%
  - Final Report 15%, Milestones 6%
- Assignment 3: Getting the Design Right: 14%
  - Final Report 10%, Milestones 4%
- Assignment 4: Communicating the Design: 15%
  - Website 5%, Video Prototype 5%, Poster 5%
- Presentations: 12%
  - Getting the Right Design 5%, Getting the Design Right 5%, Individual 2%

Exam: 25%

Readings: 5%

Participation: 5%

Submissions

Many assignments are due “night before class”

This means “before I wake up”, often 5:00am

Canvas will operationalize this as 4:00am

We need your submissions as part of
our preparation for in-class feedback

“Day of class”, “just before class”, or “in class”
are all unacceptable, risking zero credit

“Now” vs “When You Need It” Content

This course has both, we will try to distinguish

Several assigned readings will be posted

- Intentionally minimal but critical
- May be on exam
- Small reading report required

Additional resources will be made available

- If you find others you want to share, email us!

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Project Proposal Schedule

Project Brainstorm Due Tonight

- Brainstorming in Section Tomorrow

Project Proposal Due Monday Night

- Sponsored Projects Posted Tuesday

Project Bids Due Wednesday Night

- Groups Assigned Thursday
- Brainstorming in Section Friday

Assignment 1a: Project Brainstorm

You have an assignment due tonight:

http://courses.cs.washington.edu/courses/cse440/15au/assignments/assignment1/

Propose 3 project domains, problems, goals:

- These are starting points for brainstorming

Submit online:

- This proves that you did your preparation
- Submit via email if unable to access Canvas

Bring to section tomorrow:

- You have a lot more brainstorming ahead of you

Assignment 1b: Project Proposal

You have an assignment due Monday:

http://courses.cs.washington.edu/courses/cse440/15au/assignments/assignment1/

One page of text:

- Problem and Motivation
- Analyze the problem or idea (e.g., a scenario)

Submit online:

- Sponsored Projects will be Posted for Bidding

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Some Reflection

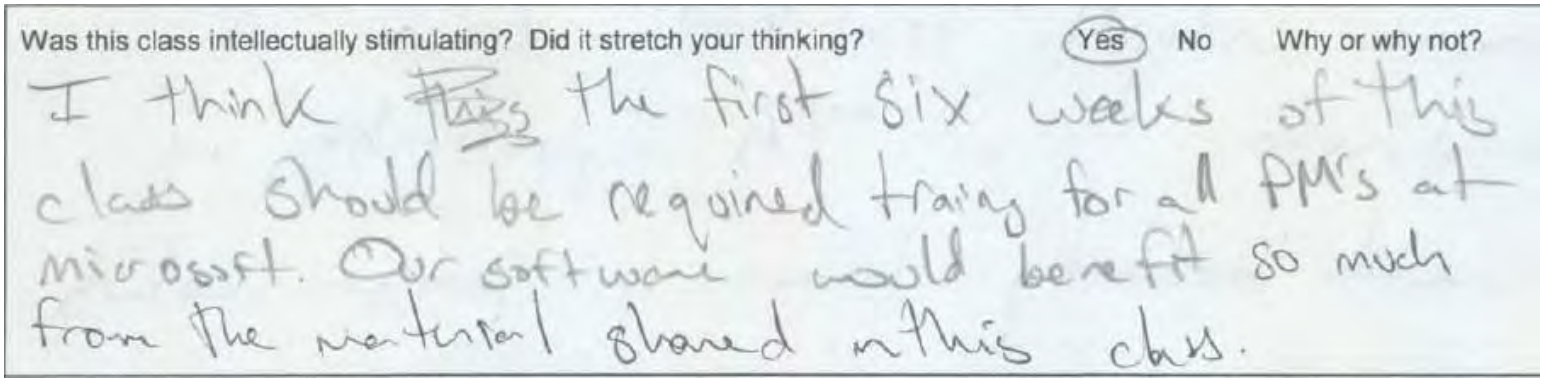
This will not be an easy course

- Students have said this was their most intense course
- You have two deadlines per week, every week
- But I believe in everything that is included

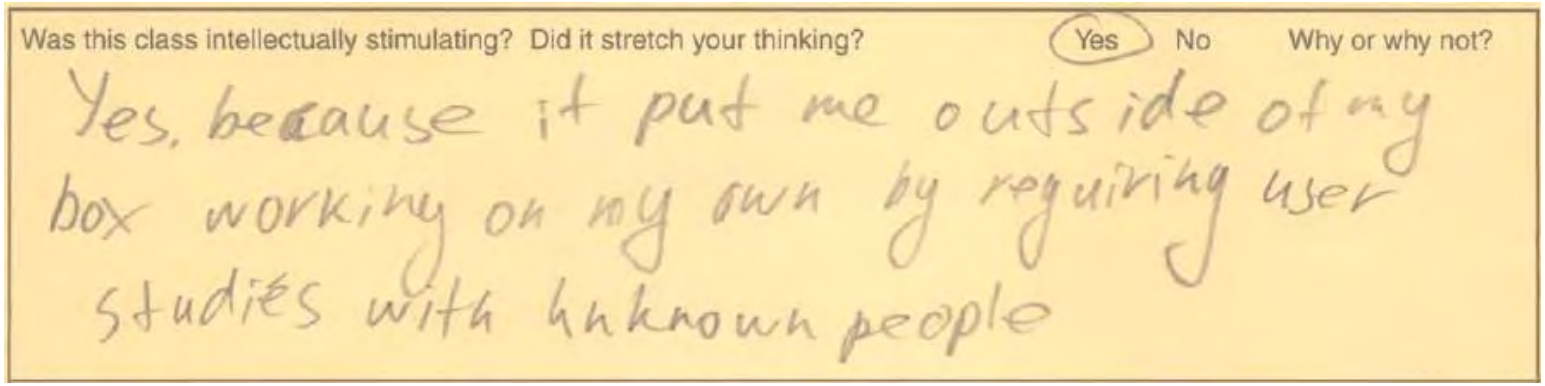
This course challenges some aspects of what the CSE curriculum has taught you is important

- It will be what you make it

People Really Get It


Was this class intellectually stimulating? Did it stretch your thinking? (Yes) No Why or why not?

I think the first six weeks of this class should be required traing for all PM's at Microsoft. Our software would benefit so much from the material shared in this class.


Was this class intellectually stimulating? Did it stretch your thinking? (Yes) No Why or why not?

Yes, because it put me outside of my box working on my own by requiring user studies with unknown people

People Really Get It

"Very good class that every engineer should have to take. Good perspectives and made me think outside my comfort zone."

"The focus on projects and fieldwork was very well suited to my learning style. I greatly enjoyed this format. The theory and techniques taught in class were directly applicable to the projects we were doing and were usually timed very well. That is, usually the topics presented in lecture were relevant to the current deliverable or the next deliverable."

People Really Get It

"I can't believe I'm saying this, but I found the lectures a huge part of what I learned in this course. They were useful and organized, and each one had a clear message and topic. The assignments were an excellent extension of these themes."

"Fieldwork and iterative assignments really taught me how important the design process is."

Group Work is Hard Work

"the project placed groups in a realistic situation and forced us to work together effectively and practice relevant concepts/strategies"

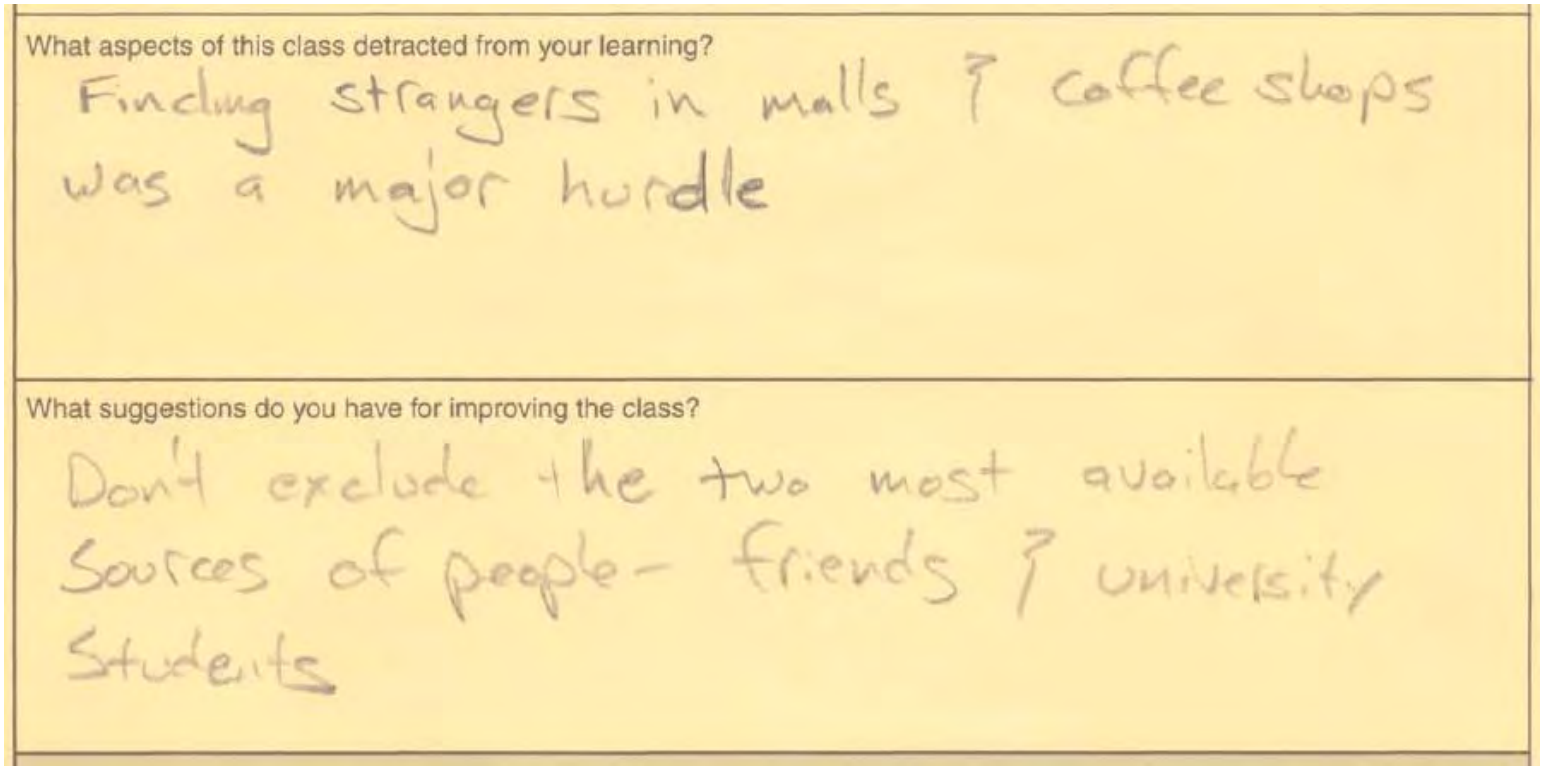
"The group work was distracting because of the lack of unity and sense of purpose. We all had different priorities and purposes for taking the class and this made it really hard to be on the same page for the project which was the biggest part of this class."

Group Work is Hard Work

"Have groups do a team charter - outlining what they expect from one another as teammates. I took a project management course and when working in a group with individuals you've never worked with, the team charter may help break the ice easier when everyone can say what their expectations are."

"… I think that working effectively as a team was the most challenging part of this class …"

And it is not for Everybody



What aspects of this class detracted from your learning?

Finding strangers in malls & coffee shops was a major hurdle

What suggestions do you have for improving the class?

Don't exclude the two most available sources of people - friends & university students

Adding and Dropping

Attempting to Add

- Say something to me after class
- Will email today, attempt to finalize decisions

Considering Dropping

- Do so before we assign teams, and tell us

Section switch availability

- We may need to move people to balance sections

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Thousands of Health Monitoring Apps

Activity and Medical Sensing Devices

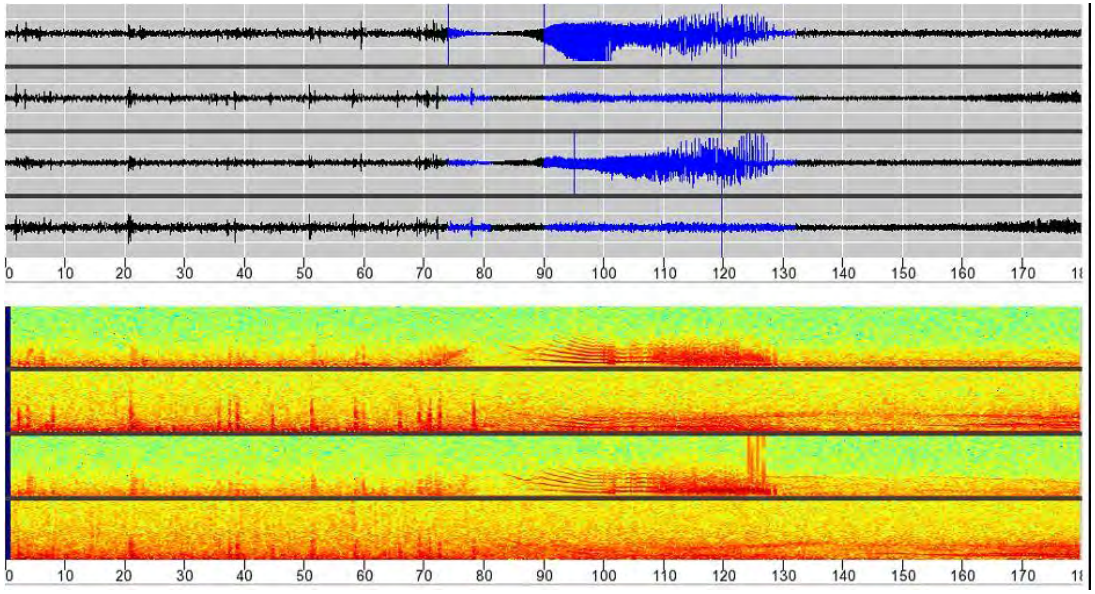
Blood glucose meter

Thermometer

Blood pressure monitor

Heart rate monitor

Medical Implants



NeuroPace

Sustainability Tracking

Kill A Watt

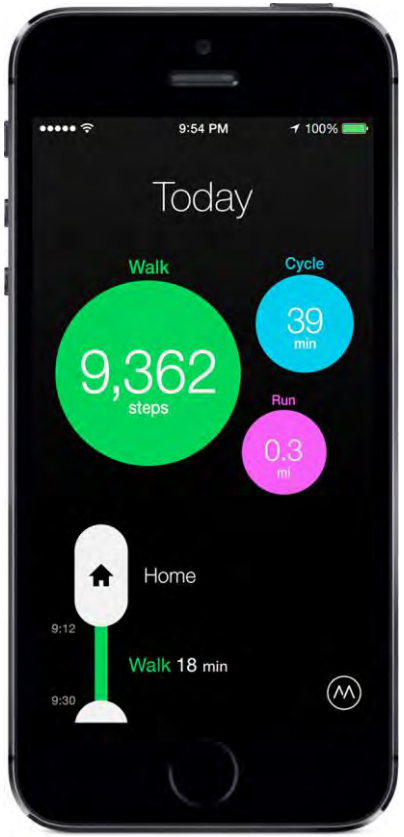
Belkin
WeMo Water

Automatic

Location and Activity

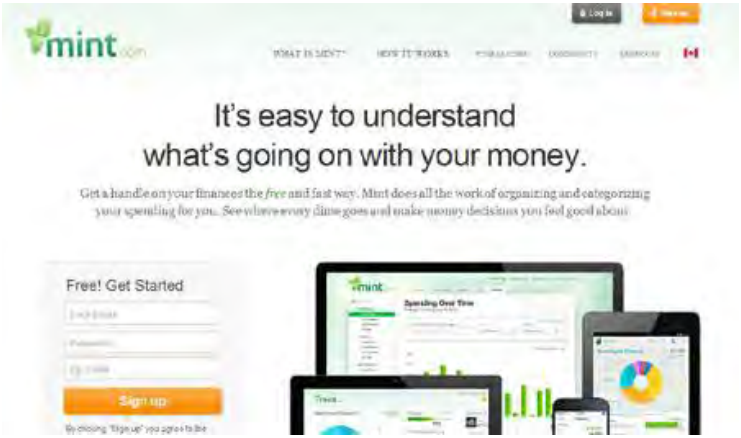
FitBit

FitBark



Moves

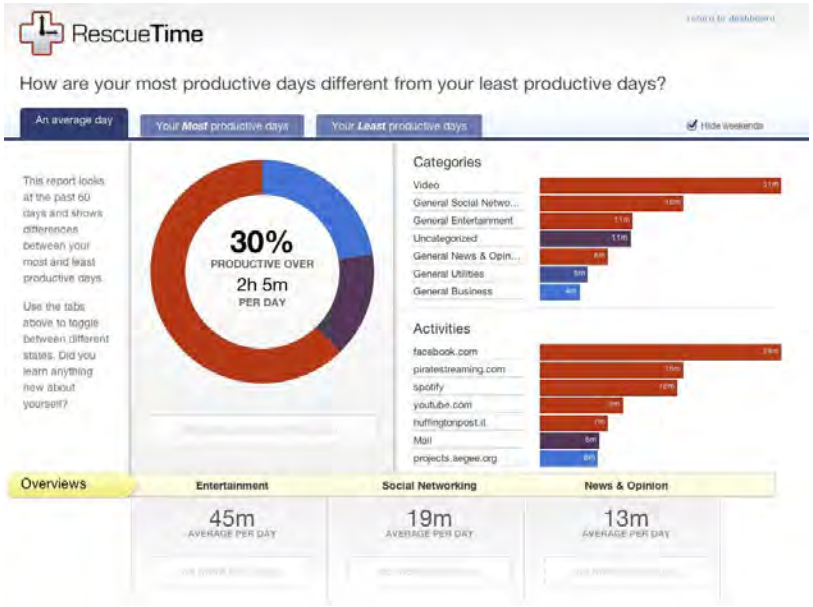
Finances



Mint

You Need a Budget

Time Tracking



RescueTime

Background in Personal Informatics

Some Definitions

What is the Point?

What is the Problem?

Chester, T. (2013). *The Sunday Times*. "You Are Just a Number"

What is Personal Informatics

"We define personal informatics systems as those that help people collect personally relevant information for the purpose of self-reflection and gaining self-knowledge. There are two core aspects to every personal informatics system: collection and reflection."

Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

What is Quantified Self

"The Quantified Self is an international collaboration of users and makers of self-tracking tools."

"Our aim is to help people get meaning out of their personal data."

"Self knowledge through numbers."

Wolf G. (2009). *Wired Magazine.* "Know Thyself: Tracking Every Facet of Life, from Sleep to Mood to Pain, 24/7/365"

What is the Point?

Gnothi seauton

"Know thyself"

Leonardo da Vinci

Leonardo da Vinci

- Odometers on the left
- Pedometer on the right

To track troop activities

Benjamin Franklin

Temperance
Silence
Order
Resolution
Frugality
Industry
Sincerity
Justice
Moderation
Cleanliness
Tranquility
Chastity
Humility

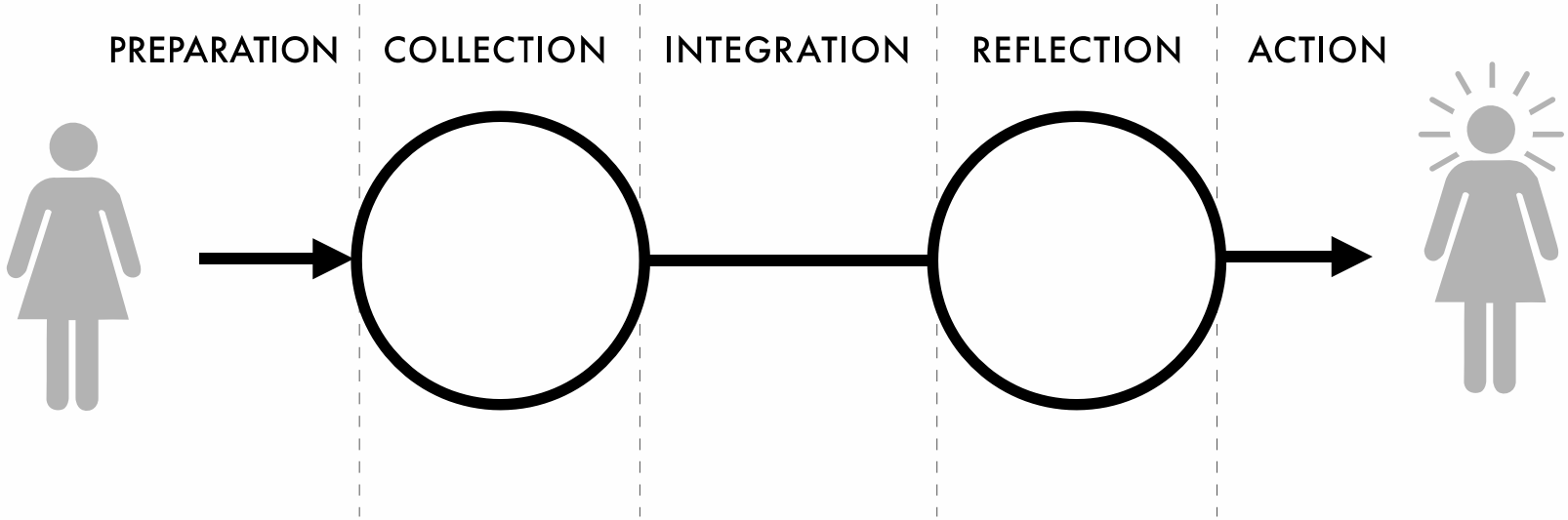
Benjamin Franklin

TEMPERANCE.							
EAT NOT TO DULLNESS. DRINK NOT TO ELEVATION.							
	S.	M.	T.	W.	T.	F.	S.
T.							
S.	*	*		*		*	
O.	* *	*	*		*	*	*
R.			*			*	
F.		*			*		
I.			*				
S.							
J.							
M.							
C.							
T.							
C.							
H.							

Manpokei

万歩計

Five-Stage Model of Personal Informatics



Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

Five-Stage Model of Personal Informatics

Alice

20 years old

Has a family history of heart disease

Wants to be more active

Does not know how, because she is busy

Li I., Dey A., Forlizzi J. *CHI 2010.* "A Stage-Based Model of Personal Informatics Systems"

Preparation

Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

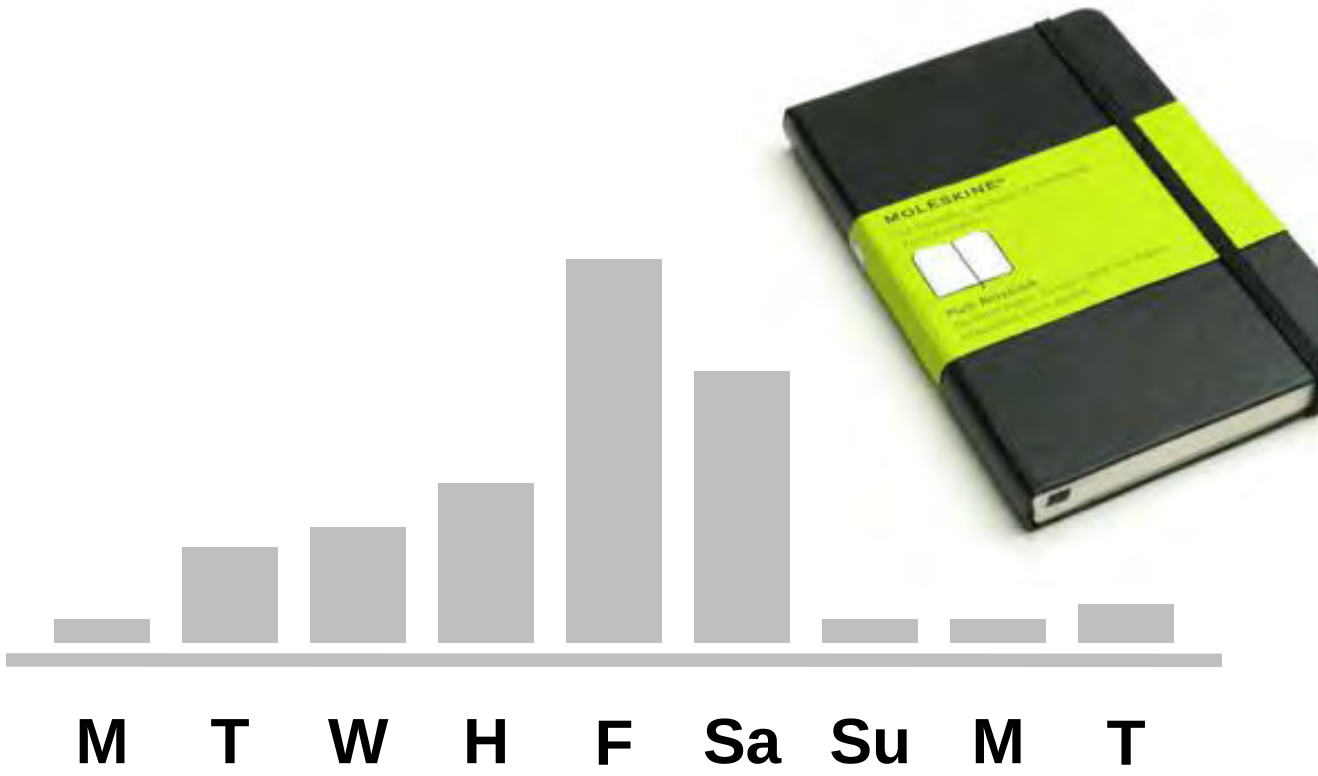
Preparation

Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

Collection

Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

Integration



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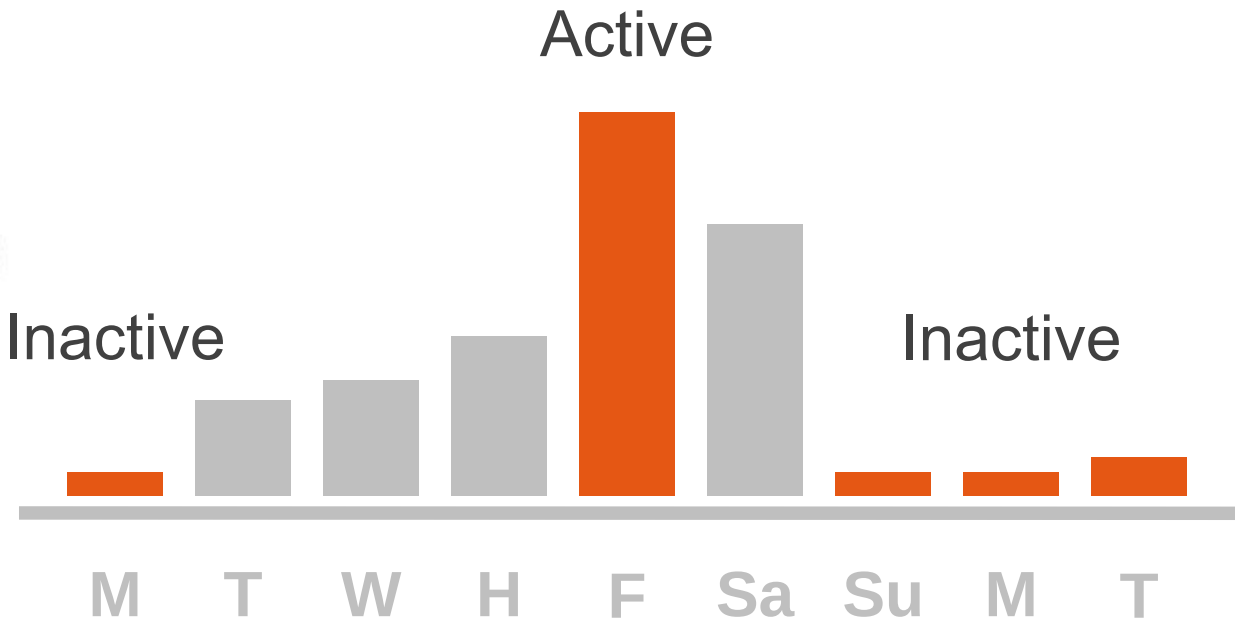
Reflection



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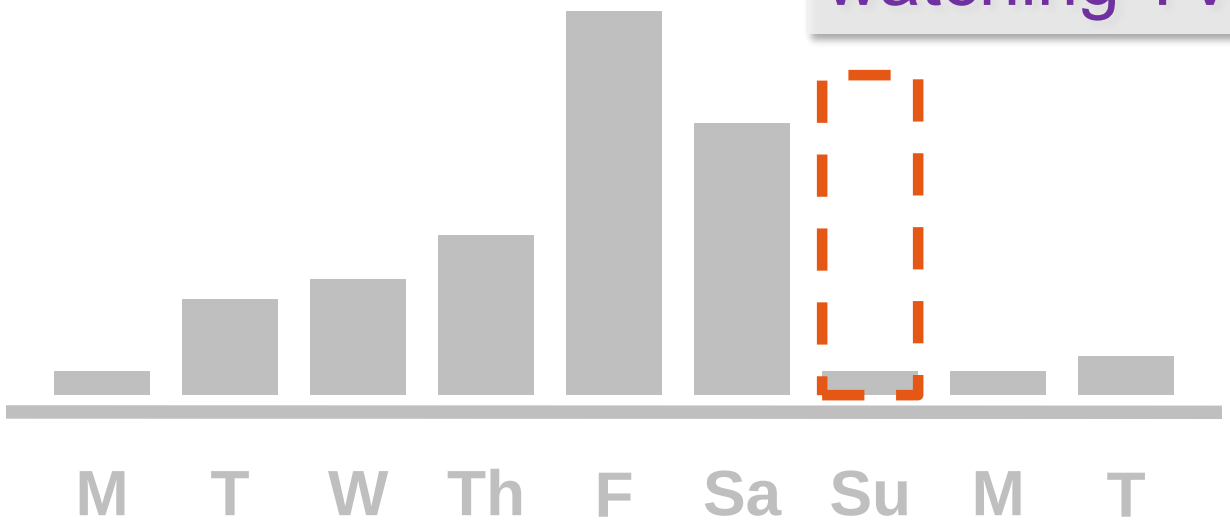
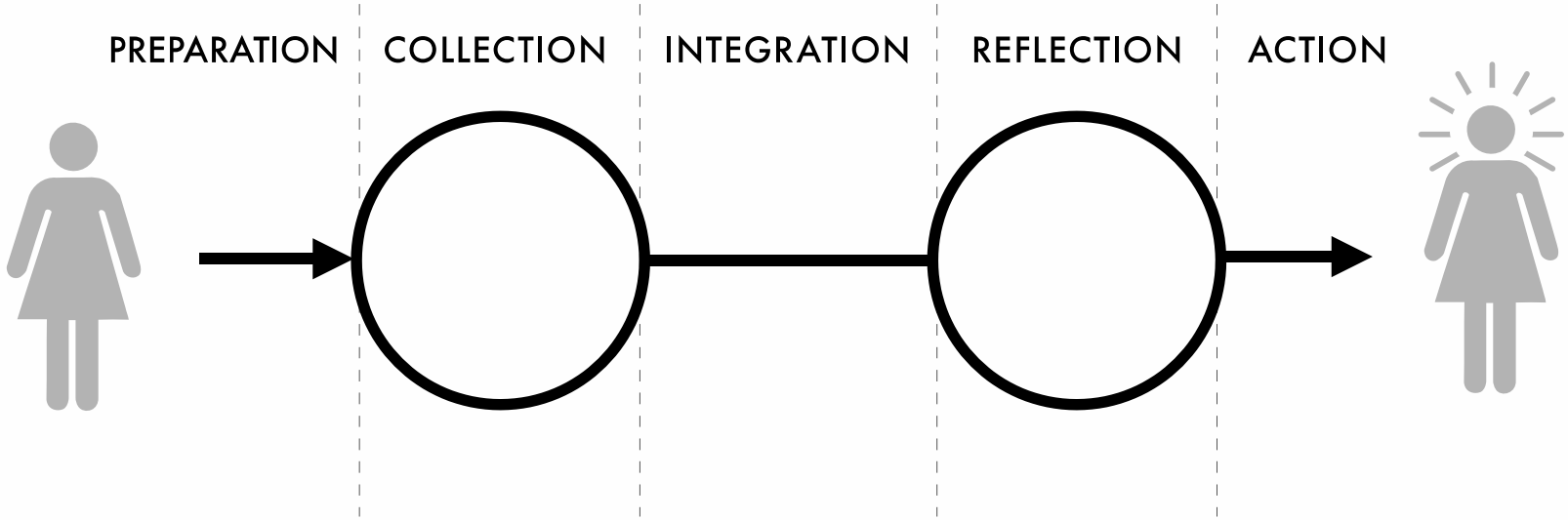
Action

Walk in park instead of watching TV



Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

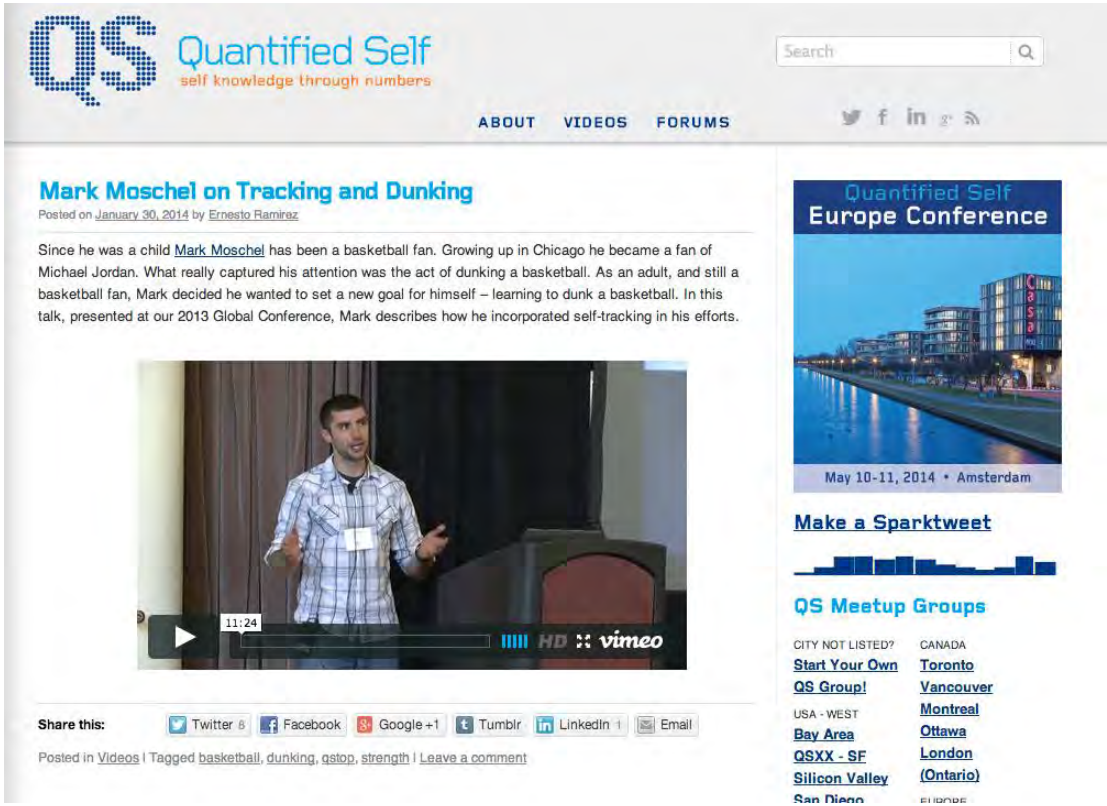
Five-Stage Model of Personal Informatics



Li I., Dey A., Forlizzi J. *CHI 2010.*
"A Stage-Based Model of Personal Informatics Systems"

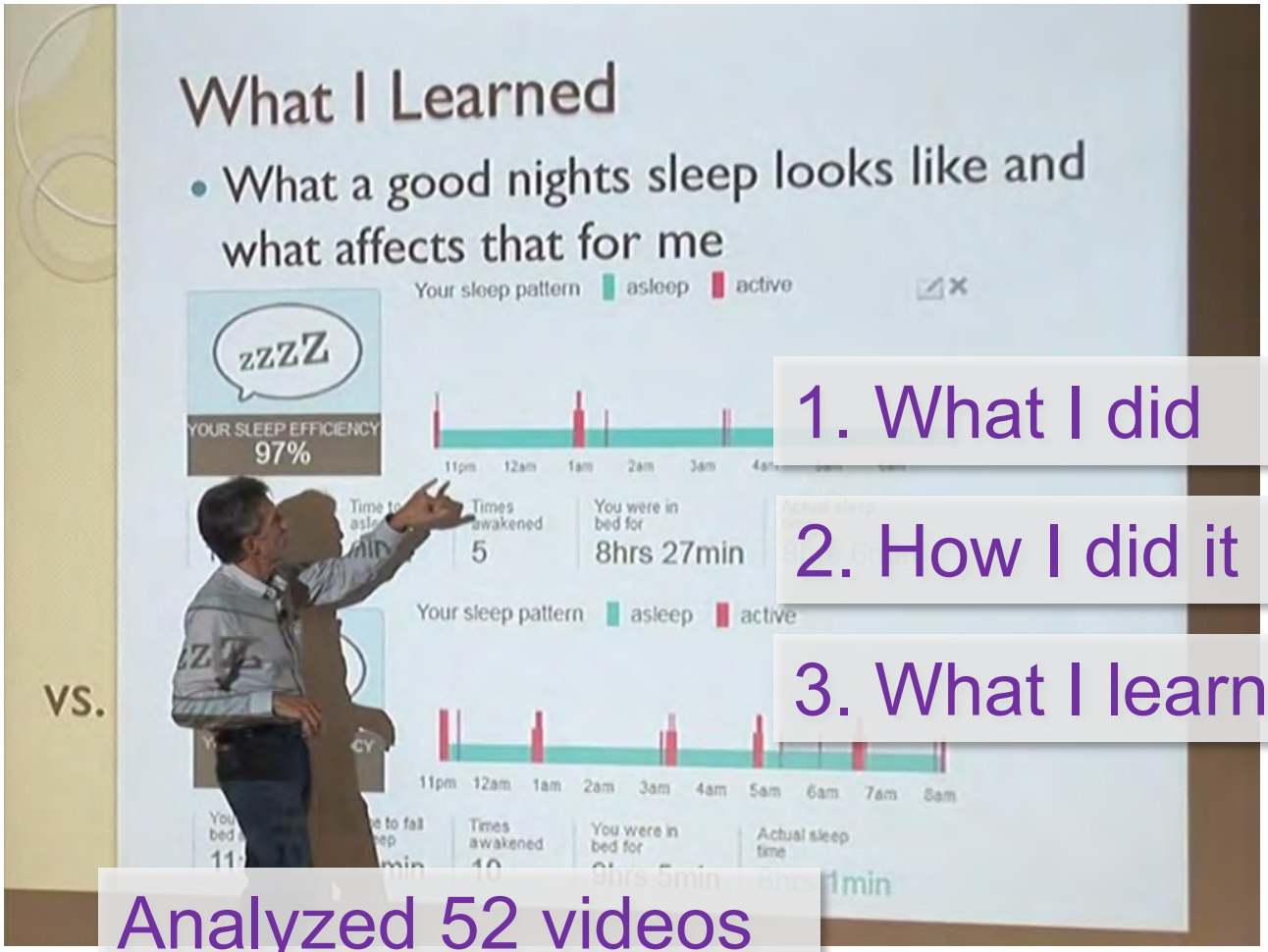
What is the Problem?

Examining serious self-trackers, as they represent the early adopters



Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
"Understanding Quantified Selfers' Practices in Collecting and Exploring Personal Data"

Quantified Self Talk Format



Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
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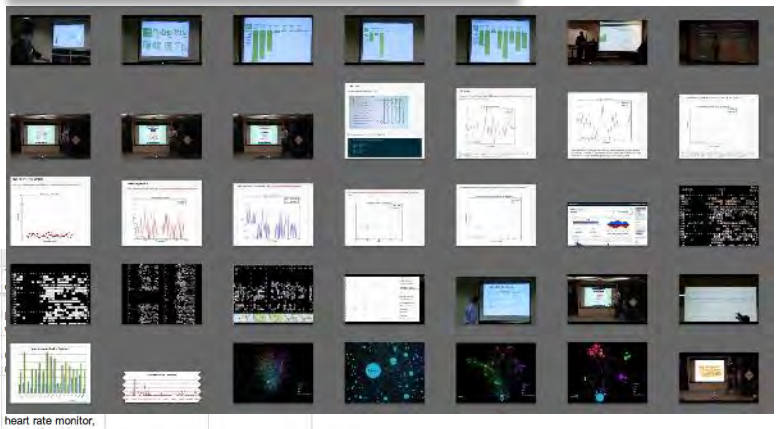
Analysis

Themes

Visualizations



	C	E	F	G	H				
1	City	Gender	Working in a tech company?	Background	Data type				
2	San Francisco	Male	Microsoft	Data analytics	Activity, Food, Sleep, Weight, Body fat, mood				
3	San Francisco	Male	startup	Data analytics, financial modeling, tech startup	Glucose				
4	London	Male	no	electronics engineer	Exercise, Food, Supplements, Medicine, biomedical data, body fat, weight, blood pressure	heart rate monitor, pen and paper, Excel	cancer	6 years	Commercial
5	Seattle	Male	startup	interface designer, VP of product, web development	Weight, Food, Sleep, Productivity	scale, Fitbit, RescueTime (productivity measuring tool)		2 years	Commercial
6	London	Male	startup	software engineer, network engineer	rowing strokes, distance rowed, time rowed, calories	arduino, speadsheet	overweight	5 months	
7	San Francisco	Male	startup	robotics, software, product development	proximity to cars, location	smartphone, sonar		1 year	user-generated
8	Beirut	Female		mechanical engineer	heart rate	custom heart rate monitor			user-generated
9	Toronto	Male	Rogers	programmer, performance manager, big data	food, fitness, cognitive performance, anxiety, media consumption, sleep, location, finance, biomedical data, reading, glucose			20 years	

Profiles

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
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What do they Track?

A Diabetic Experience with Self-Quantification

Analyzing My Cancer Data

Going Vegan in December

Improving Skin Health

Cognitive Performance

15 Weeks of Self-Tracking

Diabetes, Exercise, and QS

Experience Sampling of My Stress

Hacking Your Subconscious Mind

Self-tracking is more than just buying a FitBit

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
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Motivations for Tracking

Motivations	Sub-categories
To improve health	To cure or manage a condition
	To achieve a goal
	To find triggers
	To answer a specific question
	To identify relationships
	To execute a treatment plan
	To make better health decisions
	To find balance
To improve other aspects of life	To maximize work performance
	To be mindful
To find new life experiences	To satisfy curiosity and have fun
	To explore new things
	To learn something interesting

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
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Data Collection and Exploration Tools

Data Collection Tool	% (#)
Commercial hardware	56% (29)
Spreadsheet	40% (21)
Custom software	21% (11)
Pen and paper	21% (11)
Commercial software	19% (10)
Commercial website	10% (5)
Camera	6% (3)
Open-source platform	6% (3)
Custom hardware	4% (2)
Other	10% (5)

Data Exploration Tool	% (#)
Spreadsheet	44% (23)
Custom software	35% (18)
Commercial website	27% (14)
Commercial software	12% (6)
Open-source platform	8% (4)
Statistical software	4% (2)
Pen and paper	2% (1)

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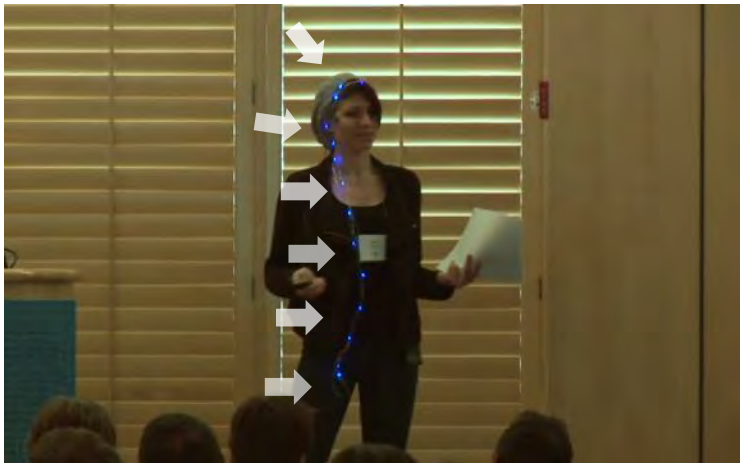
Building Custom Tools



Captures smile via wearable sensing
Provides real-time feedback

Captures snoring via mobile app
Provides data visualization

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
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Custom Visualizations

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
"Understanding Quantified Selfers' Practices in Collecting and Exploring Personal Data"

Why are they Building Custom Tools?

Desirable features are not supported

- Collect and reflect on the data using a single tool
- Perform self-experimentation

Barriers to success

- Tracking too many things
- Not tracking triggers and context
- Lacking scientific rigor

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
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Tracking Too Many Things

"I can honestly say that I've made the classic newbie self-tracking mistake which is that I track everything. I didn't know exactly what to track, so I tracked caffeine, dairy, wheat, sugar, nuts, fruit, vegetables, meat, chicken, fish, alcohol supplements…"

People burn out on self-tracking

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
"Understanding Quantified Selfers' Practices in Collecting and Exploring Personal Data"

Not Tracking Triggers and Context

"I was trying to track all these symptoms and I was completely ignoring the cause…"

People lack clues on what to track

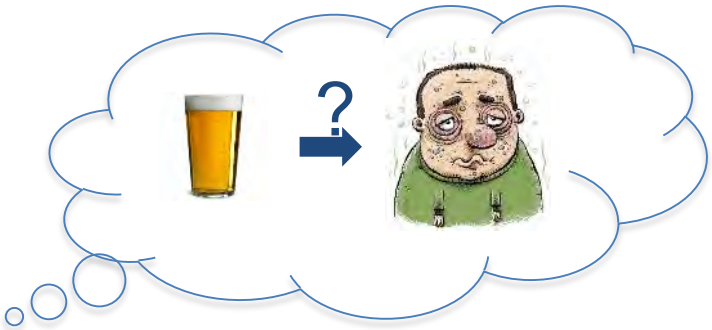
Miss information on how to improve outcome

They track the wrong information

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
"Understanding Quantified Selfers' Practices in Collecting and Exploring Personal Data"

Lacking Scientific Rigor

Conduct self-experimentations without control or without addressing confounding factors



And they conduct flawed experiments

Choe E.K., Lee N.B., Lee B., Pratt W., Kientz J.A. CHI 2014.
"Understanding Quantified Selfers' Practices in Collecting and Exploring Personal Data"

Barriers and Negative Nudges

"It was too time consuming and tedious. I also did not know what to enter if I ate out, so I often did not enter data and that compounded. I also felt embarrassed to do it in front of friends so I stopped."

Negative Nudges:

Contrasting difficulty of entry

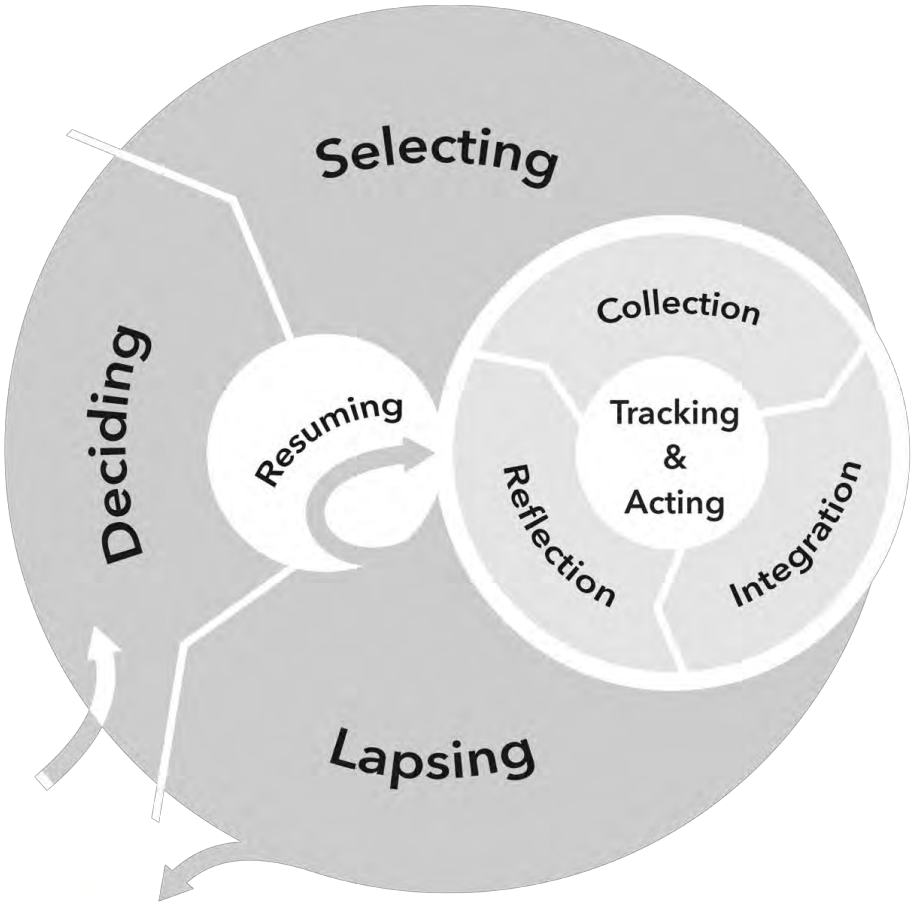
Judgment and choosing not to journal

Stigma and journaling

Lack or decline in social support

Felicia Cordeiro, Daniel A. Epstein, Edison Thomas, Elizabeth Bales, Arvind K. Kagannathan, Gregory D. Abowd, James Fogarty. CHI 2015. Barriers and Negative Nudges: Exploring Challenges in Food Journaling

A Model of Lived Informatics



Extends 5-stage model to surface additional design lifecycle and challenges

Returning to a tool
(e.g., short/long lapse)

Changing tools
(e.g., due to burden)

Changing goals
(e.g., due to discovery)

Daniel A. Epstein, An Ping, James Fogarty, Sean Munson. UbiComp 2015.
A Lived Informatics Model of Personal Informatics

Your Challenge

People invest tremendous effort for little value

Do better, help people achieve their goals, solve real problems

Go beyond the data fetish

- Understand the problems people face
- Find the role for interactive technology

Some Reflection

We have high expectations

- We want you to do cool stuff

But we are also enthusiastic and we listen

- Email us, point out opportunities, ask questions

If you are not onboard, please drop now

- Please email us so that we know a spot opened

cse440-instr [at] cs.washington.edu

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 01:
Introduction and
Personal Informatics

James Fogarty
Alex Fiannaca
Lauren Milne
Saba Kawas
Kelsey Munsell

Tuesday/Thursday
12:00 to 1:20