CSE 440: Introduction to HCI
User Interface Design, Prototyping, and Evaluation

Lecture 01: Introduction and Personal Informatics

James Fogarty
Eunice Jun
David Wang
Elisabeth Chin
Ravi Karkar

Tuesday / Thursday
10:30 to 11:50
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
Door Quiz
What is so Special about Computers?

Nothing! It is about good designs and bad designs.

We 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.
Signs Do Not Help
Signs Do Not Help
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
Design Research & Task Analysis

Observe practices and understand needs
Sketching & Storyboarding

Post

Trips

Past

Find

My Trips

Community

Friend's Trips

Nearby trips

RideAlong
Sketching & Storyboarding

RouteMyRun
Low-Fidelity Prototyping & Testing

RideAlong
Digital Mockup

Balance
Video Prototypes

GetOut

PickUp
Learn by Example from Prior 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:
Learn by Example from Prior Projects

Soundscape:
Learn by Example from Prior Projects

Balance:

Learn by Example from Prior Projects

Neat:

Learn by Example from Prior Projects

Poliscope:
Learn by Example from Prior Projects

School View:
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 always brings a milestone to studio
Participation is a critical component of the course

Project time on Tuesdays
Your team always has a milestone due
Class will often include project time or activity
Overview

HCI and the Project Sequence
Course Staff Introductions
Administrivia

Assignment 1: Project Proposal
  Assignment 1a: Due for Friday
  Assignment 1b: Due for Tuesday

Some Reflection
Self-Tracking and Relevant Background
Who We Are

James Fogarty

Prefer: James / He / Him

Background

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

You

Computing

You
Who We Are

Eunice Jun

Prefer: Eunice / She / Her

Background:

BS, Cognitive Studies & Computer Science
Vanderbilt, 2016

Research:

Increasing engagement in multicultural online communities, including large-scale online experiments

Interests:

Hiking, learning new languages, ballet, getting lost
Who We Are

David Wang

Prefer: David / He / Him

Background:

BS, Informatics (HCI)
UC Irvine, 2013
MS, HCDE
University of Washington, 2017

Research:

Collapse informatics, ubiquitous computing

Interests:

Outdoors, travel, making (ask me about the food truck harness)
Who We Are

Elisabeth Chin

Prefer: Elisabeth / She / Her

Background

BS, Informatics: HCI
University of Washington, 2017

Interests

Movies (watched 72 in 2016!), making fresh noodles, cross-cultural studies, all sorts of rock music
Who We Are

Ravi Karkar

Prefer: Ravi / He / Him

Background

BE, Gujarat University, 2011
MS, Georgia Tech, 2012
MS, University of Washington, 2016

Research

Designing and building tools to support people in their diagnostic self-tracking

Interests:

Sleeping, getting 404s, hunting horcruxes
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Staying in Touch

Web: http://www.cs.washington.edu/440
You are responsible for calendar

Canvas: I hate Canvas so much but we have to use it for some things

Email Us: cse440-instr [at] cs.washington.edu

Email: You are responsible for course email

Office: Posted on Calendar

Hours: Also By Appointment
GitHub Repository

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

https://github.com/uwcse440/web-cse440-wi17

You will contribute when posting your projects

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

Exam: 25%
Individual Readings: 5%
Participation: 5%
Submissions

Many assignments are due “night before class”

Canvas will operationalize this as 12:01am
A bit more slack, but definitely “before I wake up”

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 assignment

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 for Friday

Brainstorming in Section Friday

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 for Friday:

http://courses.cs.washington.edu/courses/cse440/17wi/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 Friday:

You have a lot more brainstorming ahead of you
Assignment 1b: Project Proposal

You have an assignment due for Tuesday:

http://courses.cs.washington.edu/courses/cse440/17wi/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
Self-Tracking and Relevant Background
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
“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 quickly
- Must enforce a hard enrollment cap

Considering Dropping
- Do so before we assign teams, and tell us

Section switch availability
- We may need help in balancing sections
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Self-Tracking and Relevant Background
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
Garmin
FitBark
Moves
Time Tracking

RescueTime

How are your most productive days different from your least productive days?

30% productive over 2h 5m per day
Finances

Mint

You Need a Budget
Background in Personal Informatics

Some Definitions

What is the Point?

What is the Problem?

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.”

What is the Point?

Gnothi seauton
“Know thyself”
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

<table>
<thead>
<tr>
<th>TEMPERANCE.</th>
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万歩計
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”
Integration

Li I., Dey A., Forlizzi J. CHI 2010.
“A Stage-Based Model of Personal Informatics Systems”
Reflection

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

1. What I did

2. How I did it

3. What I learned

Analyzed 52 videos

Analysis

Profiles

Visualizations

Themes

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

## Motivations for Tracking

<table>
<thead>
<tr>
<th>Motivations</th>
<th>Sub-categories</th>
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<tr>
<td>To improve health</td>
<td>To cure or manage a condition</td>
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<td>To achieve a goal</td>
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<td>To find triggers</td>
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<td>To answer a specific question</td>
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<td>To identify relationships</td>
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<td>To execute a treatment plan</td>
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<td>To make better health decisions</td>
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<td>To find balance</td>
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<td>To improve other aspects of life</td>
<td>To maximize work performance</td>
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<td>To be mindful</td>
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<td>To find new life experiences</td>
<td>To satisfy curiosity and have fun</td>
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<td></td>
<td>To explore new things</td>
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<td></td>
<td>To learn something interesting</td>
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## Data Collection and Exploration Tools

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<tr>
<th>Data Collection Tool</th>
<th>% (#)</th>
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<tbody>
<tr>
<td>Commercial hardware</td>
<td>56% (29)</td>
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<tr>
<td>Spreadsheet</td>
<td>40% (21)</td>
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<tr>
<td>Custom software</td>
<td>21% (11)</td>
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<tr>
<td>Pen and paper</td>
<td>21% (11)</td>
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<tr>
<td>Commercial software</td>
<td>19% (10)</td>
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<tr>
<td>Commercial website</td>
<td>10% (5)</td>
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<tr>
<td>Camera</td>
<td>6% (3)</td>
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<td>Open-source platform</td>
<td>6% (3)</td>
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<tr>
<td>Custom hardware</td>
<td>4% (2)</td>
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<tr>
<td>Other</td>
<td>10% (5)</td>
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<table>
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<th>Data Exploration Tool</th>
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<tbody>
<tr>
<td>Spreadsheet</td>
<td>44% (23)</td>
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<tr>
<td>Custom software</td>
<td>35% (18)</td>
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<tr>
<td>Commercial website</td>
<td>27% (14)</td>
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<tr>
<td>Commercial software</td>
<td>12% (6)</td>
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<tr>
<td>Open-source platform</td>
<td>8% (4)</td>
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<td>Statistical software</td>
<td>4% (2)</td>
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<tr>
<td>Pen and paper</td>
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Building Custom Tools

Captures smile via wearable sensing
Provides real-time feedback

Captures snoring via mobile app
Provides data visualization

Custom Visualizations

“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

“Understanding Quantified Selfers’ Practices in Collecting and Exploring Personal Data”
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

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
Missing information on how to improve outcome

They track the wrong information

Lacking Scientific Rigor

Conduct self-experimentations without control or without addressing confounding factors

And they conduct flawed experiments

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

A Model of Lived Informatics

Extends 5-stage model to surface additional opportunities and challenges in lifecycle

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

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

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

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
Your Challenge

Explore tracking beyond the self:
- co-located relationships
- remote relationships
- communities organizing
- people seeking help from peers
- people seeking help from experts

Any problem where multiple people collect data, or where multiple people engage in gaining value from data, introduces additional opportunities and challenges in designing for effective interaction with personal data.
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

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