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
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
Contextual Inquiry & Task Analysis

Observe practices and understand needs

Consumester

FoodWatch
Sketching & Storyboarding

Post
  Trips
    Past
    Find

My Trips
  Community
    Friend’s Trips
    Nearby trips

RideAlong
Sketching & Storyboarding

RouteMyRun
Low-Fidelity Prototyping & Testing

RideAlong
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:

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

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

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
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 training for all PMs at Microsoft. Our software would benefit so much from the material shared in this class.

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.”
“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.”
“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

<table>
<thead>
<tr>
<th>What aspects of this class detracted from your learning?</th>
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<tbody>
<tr>
<td>Finding strangers in malls &amp; coffee shops was a major hurdle</td>
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<tr>
<th>What suggestions do you have for improving the class?</th>
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<tr>
<td>Don't exclude the two most available sources of people - friends &amp; university students</td>
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</table>
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?

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

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<thead>
<tr>
<th>TEMPERANCE.</th>
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<td>EAT NOT TO DULLNESS.</td>
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<td>DRINK NOT TO ELEVATION.</td>
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Manpokei

交通巡査 11200歩→6.7km（8時間）

ビショップホールのウェークレス 12550歩→5.5km（8時間）

エアホステス 9000歩→4.1km（6時間半）
Five-Stage Model of Personal Informatics

PREPARATION | COLLECTION | INTEGRATION | REFLECTION | ACTION

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

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

PREPARATION | COLLECTION | INTEGRATION | REFLECTION | ACTION

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

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

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

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
Miss 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 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)

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 HCl
User Interface Design, Prototyping, and Evaluation

Lecture 01:
Introduction and
Personal Informatics

James Fogarty
Alex Fiannaca
Lauren Milne
Saba Kawas
Kelsey Munsell

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