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

Lecture 01: Introduction and Personal Informatics

Tuesday / Thursday
12:00 to 1:20

James Fogarty
Kailey Chan
Dhruv Jain
Nigini Oliveira
Chris Seeds
Jihoon Suh
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

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
Digital Mockup

Balance
Video Prototypes

GetOut

PickUp
Learn by Example from Prior Projects

Autumn 2014 - Aqueous:
Learn by Example from Prior Projects

Autumn 2014 - IEP Connect:

https://courses.cs.washington.edu/courses/cse440/14au/projects/iepconnect/
Learn by Example from Prior Projects

Autumn 2014 - Ka-Ching:

Learn by Example from Prior Projects

Autumn 2014 - Soundscape:

Learn by Example from Prior Projects

Autumn 2015 - Balance:

Learn by Example from Prior Projects

Autumn 2015 - Neat:
Learn by Example from Prior Projects

Autumn 2015 - Poliscope:
Learn by Example from Prior Projects

Autumn 2015 - School View:
Learn by Example from Prior Projects

Winter 2017 - BookWurm:
https://courses.cs.washington.edu/courses/cse440/17wi/projects/bookwurm/
Learn by Example from Prior Projects

Winter 2017 - Dash:
https://courses.cs.washington.edu/courses/cse440/17wi/projects/dash/
Learn by Example from Prior Projects

Winter 2017 - Jasper:
https://courses.cs.washington.edu/courses/cse440/17wi/projects/jasper/
Learn by Example from Prior Projects

Winter 2017 - Wishing Well:

https://courses.cs.washington.edu/courses/cse440/17wi/projects/wishingwell/
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

Tuesday milestones

Your team always has a milestone due
Class may include project time or activity
Seek feedback (e.g., via office hours)
Overview

HCI and the Project Sequence
Course Staff Introductions
Administrivia

Assignment 1: Project Proposal
  Assignment 1a: Due Tonight
  Assignment 1b: Due Monday Night

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
Professor, effective Autumn 2017

Brief Industrial Stints

IBM, 2000
IBM Research, 2003
Microsoft Research, 2007
Who We Are

Cross-Campus HCI
- DUB
- MHCID

Cross-Campus Digital Health
- UW Medicine Digital Health Advisory Committee
- UW Population Health Executive Committee

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

Kailey Chan

Prefer: Kailey / She / Her

Background

BA, Psychology, UW, 2016
MS, HCDE, UW, 2018

Research

Social Psychology (Social-Identity, Social Media)
Contextual Interfaces

Interests:

Cooking, Traveling, DIY Crafts, Dogs
Who We Are

Dhruv Jain

Prefer: DJ / He / Him

Background

B.Tech, IIT Delhi, 2013
MS, MIT Media Lab, 2016
PhD, UW, 2017

Research

Accessible Technologies
Augmented / Virtual Reality

Interests:

Scuba Diving (ah well…not anymore)
Who We Are

Nigini Oliveira

Prefer: Nigini / He / Him

Background

BS-MS, UFCG – Brazil, 2007
Entrepreneur/Lecturer, - 2012
PhD, UFCG (+UW), 2017

Research

Cross-Cultural Collaboration Design
Online Experimentation

Interests:
Literature, Bike Riding, Photography, Chatting, Coffee
Who We Are

Jihoon Suh
Prefer: Jihoon / He / Him

Background
BS, KAIST Industrial Design, 2016
MS, UW HCDE, 2018

Research
Spatial User Interfaces
Tangible Interaction

Interests:
Riding Boards (longboard, paddleboard, wakeboard)
Graffiti, Street Art (legal restrictions)
Who We Are

Christopher Seeds

Prefer: Chris / He / Him

Background:

BFA, Visual Communication Design, Kent State University, 2010
Designer in Ohio & NYC, 2010–2016
MDes, UW SoA,AH,&D, 2018

Research:

Slow Design, Design + Storytelling

Interests:

Podcasts, My Boston Terrier, Concrete Things
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Staying in Touch

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

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

Email:  You are responsible for course email list

Office Hours:  Posted on Calendar
Also By Appointment

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

Panopto:  I will probably mess it up at least once
Calendar Overview

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This page is still being improved and developed. All content (times) are subject to change.
GitHub Repository

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

https://github.com/uwcse440/web-cse440-au17/

You will contribute when posting your projects

You can otherwise 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 11:59pm
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

Do not use this to undermine team work
“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
Overview

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Assignment 1: Project Proposal
  Assignment 1a: Due for Friday
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Some Reflection
Self-Tracking and Relevant Background
Project Proposal Schedule

Project Brainstorm Due Tonight
  Brainstorming in Section Friday

Project Proposal Due Monday Night
  Sponsored Projects Posted Tuesday

Project Bids Due Wednesday Night
  Groups Assigned Thursday
  Group Brainstorming in Section Friday
Assignment 1a: Project Brainstorm

You have an assignment due tonight:

https://courses.cs.washington.edu/courses/cse440/17au/assignments/assignment1/

Propose 3 project domains, problems, goals:

These are starting points for brainstorming

Submit online:

This proves that you did your preparation
If unable to access Canvas, submit via email

Bring to section Friday:

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

1a: Project Brainstorm

Draft: Thursday, September 28, 2017 (Before section on Friday, September 29, 2017)

Friday’s session will focus on brainstorming potential project directions. You will get started on brainstorming, and see what interests you, with some general ideas.

Propose three starting points for brainstorming domains, problems, and goals that might be important for you to track:

- Domain: (e.g., tracking heart rate, thinking interventions, spending)
- Domain: (e.g., tracking physical activity, weight)
- Domain: (e.g., tracking for a specific period of time, events, other personal triggers, habits)

Good ideas (identifying behavioral symptoms):

- Be sure to focus on problems and goals, not potential design solutions. One way to help yourself identify a hierarchy of problems and goals is to ask “why?” For example:
  - Why is a person using DNF?
  - Why do they want to know how many they spend on leisure activities?

Each idea should be a single sentence, identifying the domain and the position or goal. At least one of your ideas may come from any of the domains above. You offer two ideas related to domain not in this list, in order to broaden the brainstorm. Ensure the ideas are significantly different, not small variations on the same idea.

Submission

Ensure your name and section is at the top of your submission. Your text must be submitted via Canvas.

https://example.com/assignments/assignment1a/

If you are still trying to add, or otherwise unable to access the submission system, submit via the instructor email address.

Grading

This exercise will be graded on a scale of 3 points:

- 1 point for each unique proposed idea (i.e., do not submit small variations on the same idea).

1b: Project Proposal

Draft: Monday, October 2, 2017

Propose and analyze a problem that could benefit from a design project for this class.

If one paragraph, describe the design problem and motivation. This description would convince the reader that this is a critical and engaging problem, work spending a quarter considering. Make the problem real and worthy of a project, or discuss a new idea and why it is challenging or compelling.

In this paragraph, analyze the problem and idea to give more background and context. Do not just tout the negative aspects of the current situation, but also identify some positive aspects that may be beneficial to retain.

Samples from Prior Offerings

- Winter 2017 – Proposal that ultimately became Halloween: A Happy Face.pdf
- Winter 2017 – Proposal that ultimately became Clash: A Soap Opera.pdf
- Winter 2017 – Proposal that ultimately became A Clash.pdf
- Winter 2017 – Proposal that ultimately became Working with It: an Undergraduate.pdf
- Autumn 2015 – Proposal that ultimately became Face: A Soap Opera.pdf
- Autumn 2015 – Proposal that ultimately became Psychology: A Soap Opera.pdf
- Autumn 2014 – Proposal that ultimately became A Happy Face: A Happy Face.pdf
- Autumn 2014 – Proposal that ultimately became A Happy Face: A Happy Face.pdf
Assignment 1b: Project Proposal

You have an assignment due Monday night:

https://courses.cs.washington.edu/courses/cse440/17au/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
Assignment 1b: Project Proposal

1b: Project Proposal

Date: Uploaded Monday, October 2, 2017

[Content of the project proposal is not fully visible in the image.]

1c: Project Bid

Date: Submitted Wednesday, October 4, 2017

[Content of the project bid is not fully visible in the image.]

Grading

This proposal will be graded on a scale of 10 points:
1. Problem and Motivation (3 points)
2. Analysis of Problem (2 points)
3. Novelty and Creativity (3 points)
4. Report Clarity and Presentation (2 points)

Submission

Submit your bid on projects and potential partners here.
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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

“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."
“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

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

Attempting to Add
- Must talk 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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Some Reflection
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
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

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**TEMPERANCE.**

EAT NOT TO DULLNESS.
DRINK NOT TO ELEVATION.
Manpokeni
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”
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”
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.

 Quantified Self Talk Format

1. What I did
2. How I did it
3. What I learned

Analyzed 52 videos

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

“Understanding Quantified Selfers’ Practices in Collecting and Exploring Personal Data”
## Motivations for Tracking

<table>
<thead>
<tr>
<th>Motivations</th>
<th>Sub-categories</th>
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</thead>
<tbody>
<tr>
<td>To improve health</td>
<td>To cure or manage a condition</td>
</tr>
<tr>
<td></td>
<td>To achieve a goal</td>
</tr>
<tr>
<td></td>
<td>To find triggers</td>
</tr>
<tr>
<td></td>
<td>To answer a specific question</td>
</tr>
<tr>
<td></td>
<td>To identify relationships</td>
</tr>
<tr>
<td></td>
<td>To execute a treatment plan</td>
</tr>
<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>
</tr>
<tr>
<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

### Data Collection Tool

<table>
<thead>
<tr>
<th>Tool</th>
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<tr>
<td>Pen and paper</td>
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<tr>
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### Data Exploration Tool

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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

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

“\textquote{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

“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, are frustrated by failure

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:**

Many forms:
- wearable sensors, phone and watch applications, appliances and artifacts in the environment, hybrid

Many social contexts:
- co-located relationships, remote relationships, communities organizing, seeking help from peers, seeking help from experts

New forms of interaction:
- conversational interfaces, tangible interfaces, ubiquitous computing interfaces
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-staff [at] cs.washington.edu
Attempting to Add

Submit this form to me:
http://tiny.cc/UWCSE440

I will coordinate with CSE advising about majors

Be sure that you and I have communicated before you leave today
CSE 440: Introduction to HCI
User Interface Design, Prototyping, and Evaluation

Lecture 01: Introduction and Personal Informatics

Tuesday / Thursday
12:00 to 1:20

James Fogarty
Kailey Chan
Dhruv Jain
Nigini Oliveira
Chris Seeds
Jihoon Suh