A Quick Tour of HCI

SWE233: Intelligent User Interfaces
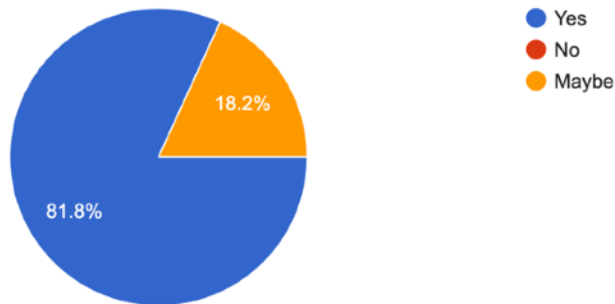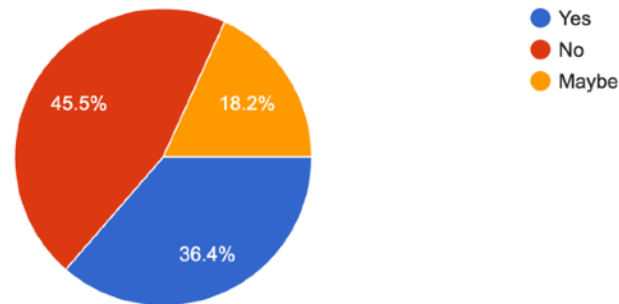https://dayenam.com/teaching/swe233-fall2025/

Daye Nam
Fall 2025

Intro Survey

Have you ever taken an AI/ML/NLP course?
11 responses

Have you ever taken an HCI/empirical methods course?
11 responses

- Yes
- No
- Maybe

18.2%

81.8%

45.5%

18.2%

36.4%

Will have 3 overview lectures on HCI/empirical methods/evaluation.
Will read and discuss many new AI papers!

Course infrastructures and logistics

Infrastructure/source of truth
    Course website: schedule, slides, syllabus, office hours
        https://dayenam.com/teaching/swe233-fall2025/

    Canvas: homework, grades, other material

    Slack: communication and collaboration

Paper Presentation & Discussion

We will read and discuss systems with intelligent user interfaces, mainly within the software engineering domain

Presentaion
Each student will present at least ~~one paper~~ **TWO PAPERS** over the quarter. As presenters, you will do a presentation of the paper and connect the paper to many aspects we cover in the first part of the quarter.

Paper selection
You will bid for a paper you want to present in the next class.
Bid for papers that are close to your potential project topic.

Learning Goals

After today's class, you should be able to

    Understand the importance and need for HCI

    Understand the challenges in designing good UIs

    Identify and describe UI/UX issues

Why Do We Care About HCI?

Human Computer Interaction

Is to make computers that are *useful and usable, and effective* for users

Accomplishes the goal by designing and building better interactions

Draws on *computer science*, psychology, design, and social sciences to understand user needs and behaviors

Why Do We Care About Users?

With user-centered design, we can

　　Help novices become more effective quickly

　　Make experts more efficient

　　Reduce errors

　　Productivity and satisfaction

　　Increase sales / reduce cost for customer support, …

　　　　<u>Removing a step during eCommerce purchase increased sales by 45%</u>

　　　　<u>= $300,000,000 / year</u>

　　Reduce redesign costs

　　Competitive Differentiation

Apple Products - iPhone & iPad

Uber / Lyft

Ride

Request a ride

Pickup location

Dropoff location

Date
Today

Time
Now

Destination suggestions

Marriott
18000 Von Karman Ave, Irvine, CA
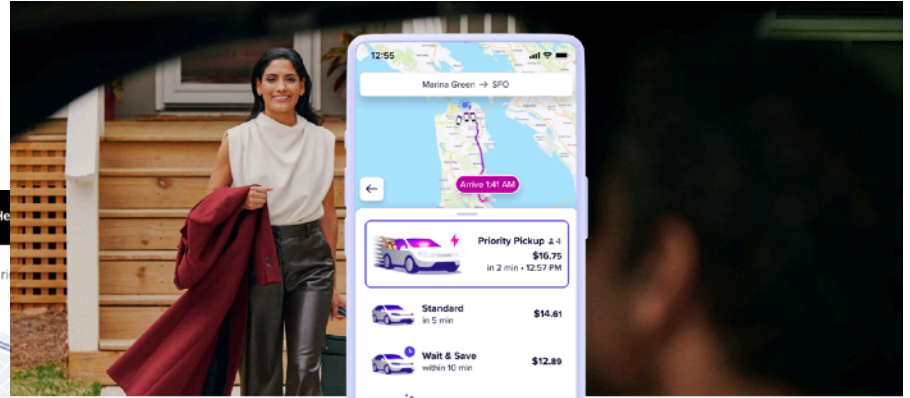
Renaissance Hotels
4500 Macarthur Blvd, Newport Beach, CA

See prices

Your airport ride
Your way

*All offerings subject to availability.

Priority Pickup ♿ 4
$16.75
in 2 min · 12:57 PM

Standard
in 5 min $14.61

Wait & Save
within 10 min $12.89

Extra Comfort
in 6 min $15.72

1234

Select Priority Pickup

RIDE SOONER WITH PRIORITY PICKUP*

Choose our fastest pickup option when
you need to travel as quickly as possible.

Start your journey

https://www.lyft.com/
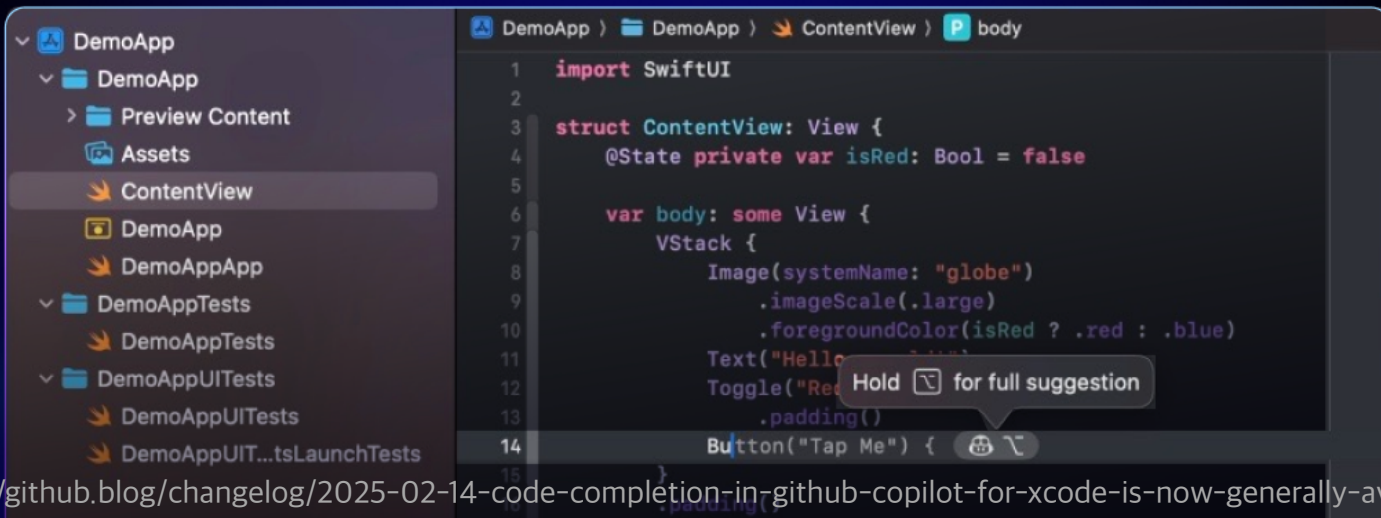
https://www.uber.com/

GitHub Copilot

Ford

Ford recalls SUVs because drivers are accidentally turning them off

By Chris Isidore @CNNMoney January 6, 2015: 7:54 AM ET

f Recommend 118

Park Out Assist

Left Side

Remove hands
Shift to forward

http://money.cnn.com/2015/01/06/autos/ford-push-button-ignition-recall/index.html

The start-stop button is nestled at the bottom of the gear selector column.

Florida Ballots in 2000

Confusion over Palm Beach County ballot

Sun-Sentinel graphic/Daniel Niblock

Hawaii Missile Threat False Alarm in 2018

BMD False Alarm

Amber Alert (CAE) - Kauai County Only

Amber Alert (CAE) Statewide

1. TEST Message

PACOM (CDW) - STATE ONLY

Tsunami Warning (CEM) - STATE ONLY

DRILL - PACOM (CDW) - STATE ONLY

Landslide - Hana Road Closure

Amber Alert DEMO TEST

High Surf Warning North Shores

Activity

As a group of 2–3,
1. Pick 1 product that you had UI/UX issues
2. Describe the issues
3. Think about how you would fix them

Why Do WE Need to Learn HCI?

Great user experience only comes about through constant diligence and attention

There are well-defined methods and techniques
     Not just opinions, luck, domain-experience
     HCI-trained people build better interfaces
     Exposure to different kinds of interfaces, problems
     User model, not system model
     Guidelines

Why are UIs Difficult to Design?

What is the "User Interface"?

Everything the user encounters

Functionality & Usefulness

Content

Presentation

Layout

Navigation

Speed of response

Emotional Impact

Documentation & Help

All Influences the Usability

Learnability

Efficiency

Memorability

User errors

Satisfaction

...

User Experience (UX)

More than usability

Emotion, Heritage
Fun, Style, Art
Branding, Reputation
Political, social personal connections
Beyond just the product itself – "Service Design"

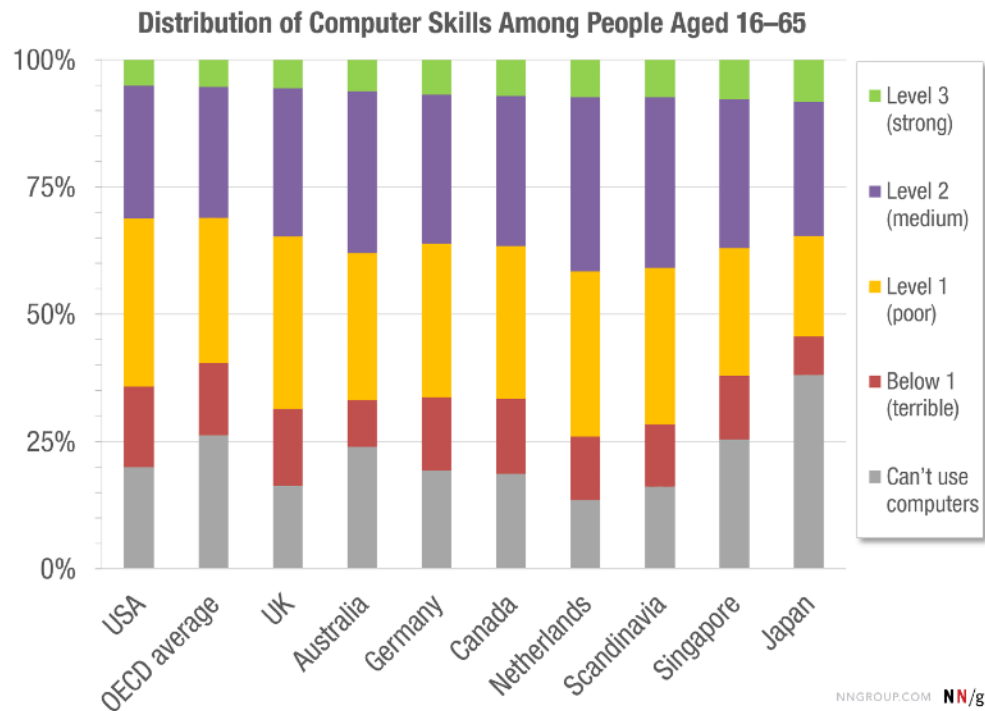# Why Hard to Design UIs?

No silver bullet

Seems easy, common sense, but seldom done right
  Once done right, however, seems "obvious"

User Interface design is a creative process

Designers (you) ≠ Users

Designers (you) ≠ Users

Distribution of Computer Skills Among People Aged 16–65

https://www.nngroup.com/articles/computer-skill-levels/ (Nov 13, 2016)

Why Hard to Design UIs?

Designers have difficulty thinking like users
    Often need to understand the task domain
    Can't "unlearn" something

Specifications are always wrong:
    "Only slightly more than 30% of the code developed in application software
    development ever gets used as intended by end-users."
                Hugh Beyer and Karen Holtzblatt, "Contextual Design: A Customer-Centric Approach to Systems Design,"
                                     ACM Interactions, Sep+Oct, 1997, iv.5, p. 62.

    Need for prototyping and iteration

A
BIRD
IN THE
THE BUSH

Why Hard to Design UIs?

All design/development involves trade-offs
> Add features
>
> Test/fix bugs
>
> Test/fix usability
>
> Cost
>
> Time-to-ship
>
> …

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Usability Methods

Contextual Inquiry
Contextual Analysis (Design)
Paper prototypes
Think-aloud protocols
Heuristic Evaluation
Affinity diagrams (WAAD)
Personas
Wizard of Oz
Task analysis
Cognitive Walkthrough
KLM and GOMS (CogTool)
Video prototyping
Body storming
Expert interviews
Information Architecture Diagrams

A/B studies
Questionnaires
Surveys
Storyboards
Journey maps
Prioritization Matrices
Log analysis
Focus groups
Card sorting
Diary studies
Improvisation
Use cases
Scenarios
Cognitive Dimensions
"Speed Dating"
Journey Maps

…

Administrivia

Problem Identification (due: Oct 8)

Submit a short abstract (300 words) that covers the following:

Problem Definition

Target Users

Intelligent Solutions

Please talk to me if you need help!

ABSTRACT

Code-generating large language models map natural language to code. However, only a small portion of the infinite space of naturalistic utterances is effective at guiding code generation. For non-expert end-user programmers, learning this is the challenge of *abstraction matching*. We examine this challenge in the specific context of data analysis in spreadsheets, in a system that maps the user's natural language query to Python code using the Codex generator, executes the code, and shows the result. We propose *grounded* abstraction matching, which bridges the abstraction gap by translating the code back into a systematic and predictable naturalistic utterance. In a between-subjects, think-aloud study (n=24), we compare grounded abstraction matching to an ungrounded alternative based on previously established query framing principles. We find that the grounded approach improves end-users' understanding of the scope and capabilities of the code-generating model, and the kind of language needed to use it effectively.

Paper Presentation Bidding (due: Oct 2 1 am)

Submit your favorite 5 paper titles in order of preference