Who are We?

James Landay

• Professor in Computer Science at Stanford
  – formerly professor at Cornell Tech, University of Washington & Berkeley
  – spent 3 years as Director of Intel Labs Seattle
• PhD in CS from Carnegie Mellon ’96
• HCI w/ focus on ubiquitous computing, smart input/output (pens, speech), web design (tools, patterns, etc.) & human-drone interaction
• Founded NetRaker, 1st in web experience management (sold to Keynote)
• Co-authored The Design of Sites with Doug van Duyne & Jason Hong
• Office Hours: Mon. 4-5 PM & Thur 10-11 AM in 390 Gates
  – we will also monitor CS147 Piazza site (signup @ piazza.com/stanford/fall2017/cs147)
• Email: landay@[insert usual Stanford email domain]

Emily Tang (Head CA)

• CS & Psychology Undergrad, CS Masters
• Interested in human behavior, educational equity, and diversity in STEM
• I like corgis
• Office Hours
  – Before class on Mondays & after studio
  – Tuesday 3:00-4:00pm @ Lathrop Tech Lounge
• Thurs 5:00-6:50PM @ Gates 392
Mixed Reality
*Merging Real and Digital Worlds*
Mixed reality is becoming increasingly popular. Apple recently announced ARKit to enable developers to easily create AR on iOS. Other mixed reality applications you might have encountered in the past: catching Pokémon on Pokémon Go, adding filters to your Snapchat, or virtually trying out IKEA furniture.

How can we leverage mixed reality (AR/VR) to create solutions for current needs?

Thurs 5:00-6:50PM @ Gates 392

Equalizing an Unbalanced Society
Extreme wealth inequality has consequences when money is essential for basics needs like education, food, shelter, healthcare, & legal services. We will examine gaps in public safety nets for those living in poverty & find tech solutions to build an equal opportunity society. Students are also welcome to tackle other sources of inequality such as discrimination.

Examples: Fresh EBT, GapJumpers
http://www.freshebt.com/ http://www.gapjumpers.me/

Fri 10:30 am – 12:20 pm @ 200-202
Fri 1:30 pm – 3:20 pm @ TBD

Improving Health with Technology
We will explore the intersection of health and technology. We’ll be looking at how to design products that use smart devices to monitor and improve health in a meaningful way. Students will be exposed to examples from different aspects of health and then choose one area to focus on for their final project.

Examples: Headspace, Strava, Fitbit, Weight Watchers Mobile, Zombies, run!

Fri 9:30am – 11:20am @ 160-120
Fri 1:30pm – 3:20pm @ TBD

Sage Isabella
• CS HCI Undergrad & SymSys Masters
• Interested in public safety nets, computer & design ethics, identity, & the future of automation
• I do ceramics and dance
• Office Hours
  – Before class on Mondays & after studio
  – TBD

Fri 10:30 am – 12:20 pm @ 200-202
Fri 1:30 pm – 3:20 pm @ TBD

Dylan Moore
• CS HCI Undergrad & Masters
• Interested in music, AI, and travel
• I learned to scuba dive this summer
• Office Hours
  – Tuesdays 3:30 - 4:30 & after studio
  – TBD

Fri 9:30 am – 11:20 am @ 160-120
Fri 1:30 pm – 3:20 pm @ TBD

Yanyan Tong
• CS Undergrad @ UCSD, Stanford CS Masters
• Interested in education, organizational behavior, food, music, and travel
• I love massage
• Office Hours
  – Before class on Mondays & after studio
  – TBD

Fri 10:30 am – 12:20 pm @ Cubberley 206
Fri 1:30 pm – 3:20 pm @ TBD
Design for Local Community

Online social networks like Facebook and Twitter allow us to connect and communicate with friends and strangers far away from us. While we spend more and more time on maintaining our network online, communities offline seem to be neglected. How could we introduce technologies to help our local community?

Examples: Meetup and Nextdoor.

Fri 10:30 am – 12:20 pm @ Cubberley 206
Fri 1:30 pm – 3:20 pm @ TBD

Human 2.0 Using Artificial Intelligence

“Machine learning” and “AI” are buzzwords we commonly hear related to technology in the modern-day. This studio will explore how AI can be used for human augmentation. AI has been used to improve everything from our interactions (Amazon Echo) to our sleep (SleepCycle) to our music (Pandora thumbprint). How else can AI be leveraged to enhance ourselves? Answering this question within this studio is made even more important as the advent of AI brings new forms of human-computer interfaces.

Examples: Amazon Echo, SleepCycle, Pandora, Focuster

Fri 8:30 am – 10:20 am @ 380-381u
Fri 11:30 am – 1:20 pm @ TBD

Putting the Education in EdTech

As the EdTech industry grows, it is critical that these new educational experiences for both children and adults be backed by learning science and be directed at real learning challenges. In this studio you will look for ways that you can use careful design and technology to enhance traditional learning experiences or create new opportunities for learning that haven’t been possible before. You will be exposed to and encouraged to draw from literature and principles from the learning sciences to ensure that your designs are as impactful as possible.

Examples: Bedtime Math, One Laptop Per Child, motion math, Connecting to your future self (Stanford VHI lab)

Fri 12:30 pm – 2:20 pm @ 300-303
Fri 2:30 pm – 4:20 pm @ TBD

Kerry Wang

- Human Biology Undergrad & CS HCI Masters
- Interested in human behavior, entrepreneurship, and social impact technology
- I jumped off the highest bungee bridge in the world – ask me where it was!
- Office Hours
  - Tuesday 1:30 pm – 2:30 pm @ Tresidder Starbucks
  - After studio

Fri 8:30 am – 10:20 am @ 380-381u
Fri 11:30 am – 1:20 pm @ TBD

Andrew McCabe

- SymSys undergrad, Learning Design and Technology masters
- Interested in civic education, relational sociology, behavior design
- To pay for grad school, I may or may not be living in the parking lot nearest you
- Office Hours
  - Mondays 4-6 pm, Lathrop Tech Lounge

Fri 12:30 pm – 2:20 pm @ 300-303
Fri 2:30 pm – 4:20 pm @ TBD

B A L A N C E

DESIGN

TECHNOLOGY
Human-Computer Interaction (HCI) Approach to UX Design

Human
- the end-user of a program
- the others they work or communicate with

Computer
- the machine the program runs on
- split between clients & servers

Interaction
- user tells the computer what they want
- computer communicates results

HCI Approach to UX Design

Organisational and Social Issues
Tasks & Activities
Technology
Humans

How to Design and Build Good UIs

- Iterative development process
- Usability goals
- User-centered design
- Design discovery
- Rapid prototyping
- Evaluation
- Programming

User Interface Development Process

Design: Discovery
- Context: Users, Tasks, Goals, Business, Marketing, Technology
- Analysis: Design, Technology, Production
- Design: Prototype, Evaluation

Design: Exploration
- Context: Users, Tasks, Goals, Business, Marketing, Technology
- Analysis: Design, Technology, Production
- Design: Prototype, Evaluation

Design: Implementation
- Context: Users, Tasks, Goals, Business, Marketing, Technology
- Analysis: Design, Technology, Production
- Design: Prototype, Evaluation

Production
- Engineering
- Manufacturing
- Deployment
- Testing
- Review & Iterate
- Work together to realize the design in detail
- Evaluate with Confidence

BREAK
Design Thinking Process

Design

Design is driven by requirements
- what the artifact is for
- not how it is to be implemented
- e.g., phone not as important as mobile app

A design represents the artifact
- for UIs these representations include:
  • screen sketches or storyboards
  • flow diagrams/outline showing task structure
  • executable prototypes
- representations simplify

Usability

According to the ISO:
The effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments

This doesn’t mean you have to create a “dry” design

Usability/User Experience Goals

• Set goals early & later use to measure progress
• Goals often have tradeoffs, so prioritize
• Example goals:
  - Learnable
    • faster the 2nd time & so on
  - Memorable
    • from session to session
  - Flexible
    • multiple ways to do tasks
  - Efficient
    • perform tasks quickly
  - Robust
    • minimal error rates
    • good feedback so user can recover
  - Discoverable
    • learn new features over time
  - Pleasing
    • high user satisfaction
  - Fun

User-centered Design

“Know thy User”

• Cognitive abilities
  - perception
  - physical manipulation
  - memory

• Organizational / educational job abilities

• Keep users involved throughout
  - developers working with target customers
  - think of the world in users’ terms
Design Discovery
Needfinding, Contextual Inquiry & Task Analysis
Observe existing practices for inspiration
Make sure key questions answered

Unpacking the Needfinding

ChoreoLab observed/interviewed dancers in studios... and out in the streets ... (or maybe Berkeley)

Develop Point of Views
(Person + Insight + Challenge)
Brainstorm on How Might We Solve

Sketching & Storyboarding

Concept Videos
- Illustrate context of use rather than specific UI
- Quick & inexpensive
- Forces designers to consider details of how users will react to the design

Concept Videos: Planning Storyboards
Rapid Prototyping

- Build a mock-up of design so you can test it
- Low fidelity techniques
  - paper sketches
  - cut, copy, paste
- Interactive prototyping tools
  - HTML, SketchFlow, Balsamiq, Axure, proto.io, Sketch+Marvel, etc.
- UI builders
  - Expression Blend + Visual Studio, Xcode Interface Builder, etc.

Goals of the Course

1) Learn to design, prototype, & evaluate UIs
   - the needs & tasks of prospective customers
   - cognitive/perceptual constraints that affect design
   - technology & techniques used to prototype UIs
   - techniques for evaluating a user interface design
   - importance of iterative design for usability
   - how to work together on a team project
     - communicate your results to a group
     - key to your future success

2) Understand where technology is going & what UIs of the future might be like

Course Format

- Interactive lectures → you speak!
- Each week
  - 2 lectures on techniques & background
    - reserved 20-30 minutes team meeting each lecture
      - you need to be here to work with your team
  - 1 studio hands-on activity or team presentation
- Quarter-long project
- Readings
- Course material will be online
  - slides, exercises, readings, schedule
  - no lecture video
- Have fun & participate!

How dt+UX Fits into CS Curriculum

- Most courses for learning technology
  - compilers, operating systems, databases, etc.
- dt+UX concerned w/ design & evaluation
  - technology as a tool to evaluate via prototyping
  - skills will become very important upon graduation
    - complex systems, large teams
Projects

• Each team will propose a UI-oriented project
  – fixing something you don’t like or completely new idea
  – based on team needfinding

• Theme
  – each Friday studio has a theme
  – all projects mobile/wearable

• Groups
  – 3-4 students to a group
  – work with students of different skill sets
  – CS students should have had 142/193p/193a or equivalent experience (non-majors need not)
  – groups meet in class & studio weekly

• Cumulative
  – apply several HCI methods to one interface

Project Process (10 weeks)

• Break into teams (Fri)
• Needfinding
  – in studio presentations & critiques
• Experience prototypes
  – in studio presentations & project selection
• Concept videos
  – in studio viewing & critiques
• Low fidelity prototyping & user tests
  – in studio presentations & critiques

Project Process Timeline

- Needfinding
- Experience Prototypes & Testing
- Low-fi Prototype
- Medium-fi Prototype
- Heuristic Evaluation
- Project Fair

CarbonShopper

StyleEye
Musistantat

ProjectHarmony

Balancer

Cookable

Token

NightOwl
Books
• We will give you web links to all necessary readings/videos
• Recommended textbook

Assignments
• Individual
  – 1 presentation each
  – 1-2 written (handed in online)
  – class & studio participation (graded)
    • 4 pop in class quizzes (drop 1)
• Group
  – 10 assignments
  – 4-5 presentations with 3-4 write-ups + video + poster
  – all group work handed in online
  • team web site & online submission site

Grading
• A combination of
  – individual assignments & presentation (10%)
  – class/studio participation (10%)
  – midterm (20%)
  – group project (60%)
    • presentations/poster (group component)
    • project write-ups
• No final
  – must present at project fair on Fri., 12/8 instead

Tidbits
• Late Policy
  – no lates on group assignments
  – individual assignments lose one letter grade/day
• Course web site
• Studio preferences & team signups
  – due Wed at 5 PM
Summary

- UX design is an important part of most of today’s software

- Getting the interface right is hard, but…

- Solution in *Iterative Design* including repeated cycles of
  - Design
  - Prototyping
  - Evaluation

Next Time

- Design Discovery

- Read
  - Holtzblatt & Beyer, Ch. 3 from *Contextual Design*