Introduction & Course Overview

CSE440: Introductory HCI

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Who are we?

- James Landay
  - Associate Professor in CSE at the University of Washington
  - formerly professor in EECS at UC Berkeley
  - spent 3 years as Director of Intel Research Seattle (ubicomp lab)
  - Ph.D. in CS from Carnegie Mellon ‘96
  - HCI w/ focus on informal input (pens, speech, etc.), web design (tools, patterns, etc.), & Ubiquitous Computing
  - founded NetRaker, leader in web experience management
  - now subsidiary of KeyNote Systems
  - Co-authored The Design of Sites with D. van Duyne & J. Hong

- Scott Saponas
  - Ph.D. student in CSE
  - BS in Computer Science from Georgia Tech.
  - HCI w/ focus on ubiquitous computing

Outline

- Who are we?
- HCI introduction
- Course overview & schedule
- Introductions

Human-Computer Interaction (HCI)

- Human
  - the end-user of a program
  - the others in the organization

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

- Interaction
  - the user tells the computer what they want
  - the computer communicates results
**User Interfaces (UIs)**

- Part of application that allows people
  - to interact with computer
  - to carry out their task
- User vs. Customer vs. Client
  - user is a term only used by 2 industries → bad!
  - customer → person who will use the product you build
  - client → the company who is paying you to build it

HCl = design, prototyping, evaluation, & implementation of UIs

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**Why is HCI Important?**

- Major part of work for “real” programs
  - approximately 50%
- Bad user interfaces cost
  - money
  - 5% satisfaction → up to 85% profits
  - finding problems early makes them easier to fix
  - reputation of organization (e.g., brand loyalty)
  - lives (Therac-25)
- User interfaces hard to get right
  - people are unpredictable
  - intuition of designers often wrong

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**Who Builds UIs?**

- A team of specialists (ideally)
  - graphic designers
  - interaction / interface designers
  - information architects
  - technical writers
  - marketers
  - test engineers
  - usability engineers
  - software engineers
  - customers
**User Interface Development Process**

- **Design**
  - Design is driven by requirements
    - what the artifact is for
    - not how it is to be implemented
    - e.g., PDA 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

- **Web Design Representations**
  - Site Maps
  - Storyboards
  - Schematics
  - Mock-ups

- **Usability**
  - According to the ISO: The effectiveness, efficiency, and satisfaction with which specified users achieve specified goals in particular environments
  - This does not mean you have to create a “dry” design or something that is only good for novices – it all depends on your goals

- **Iteration**
  - At every stage!
  - Design
  - Prototype
  - Evaluate
  - Execute

- **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
    - Discoverable
      - learn new features over time
    - Pleasing
      - high user satisfaction
    - Fun
User-centered Design

“Know thy User”

• Cognitive abilities
  – perception
  – physical manipulation
  – memory
• Organizational / job abilities
• Keep users involved throughout
  – developers working with target customers
  – think of the world in users terms
  – not technology-centered/feature driven

Task Analysis & Contextual Inquiry

• Observe existing work practices
  – augment with self-report tools (e.g., ESM)
• Create examples & scenarios of actual use
  – “Try-out” new ideas before building software

Rapid Prototyping

• Build a mock-up of design so you can test
• Low fidelity techniques
  – paper sketches
  – cut, copy, paste
• Interactive prototyping tools
  – HTML, Visual Basic, Flash, DENIM, etc.
• UI builders
  – Visual Studio .NET, JBuilder...

Evaluation

• Test with real customers (participants)
  – w/ interactive prototype
  – low-fi with paper “computer”
• Build models
  – GOMS
• Low-cost techniques
  – expert evaluation
  – walkthroughs
  – online testing

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
• Quarter long project & homeworks
• Readings
• All material is online
  – slides, exercises, readings, schedule
  – http://www.cs.washington.edu/cse440
• Have fun & participate!
How CSE440 Fits into CS Curriculum

- Most courses for learning technology
  - compilers, operating systems, databases, etc.
- CSE440 concerned with design & evaluation
  - technology as a tool to evaluate via prototyping
  - skills will become very important upon graduation
    - complex systems, large teams
    - don’t look for large immediate impact in other CS courses

Project Description

- Each of you will propose an interface idea
  - fixing something you don’t like or a new idea
- Groups
  - 4 students to a group
  - work with students with different skills/interests
  - groups meet with teaching staff every 2 weeks
  - industrial mentors will meet with teams 4-5 times
- Cumulative
  - apply several HCI methods to a single interface
  - many projects will continue into CSE441 (optional)

Project Process Overview

- Project proposal (individual) due Tuesday
- Break-up into groups next Thursday
- Project task analysis & “sketches”
  - i.e., rough proposals that can & will change
  - based on field work with ESM tool on phone
- In class presentations & critiques
- Video prototyping
- Low fidelity prototyping & user testing
- In class presentations & critiques
- Rapid prototype using tools & user test
- Heuristic evaluations (individual)
- Heuristic evaluation summary
- Final presentations & project fair with industry guests

What is CSE441?

- Takes up where this course stops
- Focus on
  - executable prototypes
  - UI toolkits & implementation
  - advanced user testing
  - design principles & studio exercises/crits
  - even more project focused

Project Examples (cont.)

- SiteSketch
  - web page design
  - sketch-based

SiteSketch
Project Examples (cont.)

- Clothes Shopper
  - online shopping
  - knows your prefs & sizes

Clothes Shopper

Project Examples (cont.)

- Electronic book reader
  - take advantage of all the online texts on the net

Electronic Book Reader

Project Examples (cont.)

- Nutrition tracker

Nutrition Tracker
Project Examples (cont.)

- cUlzine
  - recipe tool for the home

Project Examples (cont.)

- Read WWW over phone
  - find structure in pages & build voice menus
  - navigation problem
  - cache common paths & reorder?
- PDA brainstorming tool
  - small portable computers in a group meeting (say Palm Pilots)

Project Examples (cont.)

- Runner’s training log
  - input daily workouts
  - reports
  - reminders
- Mobile shopping
  - scan in UPC & tells you whether a good price? environmentally friendly?
- Home entertainment control - “no more remotes”

Total Entertainment Control

Project Examples (cont.)

- PDA Baseball score keeper
  - have stats of the players on your PDA
  - keep track of what happens during the game
  - upload stats after the game
PDA Baseball Scorekeeper

InkChat

Nutrition/Exercise Tracker

Trippin’

Traffic Monitor
Traffic Monitor

Otto: Location-based Photos

Bus Buddy

Cluster
Mobile/Ubiquitous Computing Project Themes

• Location-enhanced computing
  – Devices that are aware of their location
  – past examples include car navigation, Trippin’, finding nearby restaurants, etc

• Activity-based computing
  – applications that use inference of human physical activity to enhance our lives
  – helping care for an elder
  – helping people stay fit
  – exercise & nutrition

• Ubiquitous RFID
  – tags & readers

• Domains of special interest
  – environment
  – developing world

Administrivia

• Registration
  – limited by room and project constraints to 40
  – appeal email to me if not enrolled (due today at 5 PM)
  – tell us why you should be in the course
    • background, interests, what you can contribute
  – will email admits by Monday at 5 PM

• Roll

• James’ office hours
  – Wed. 10:30-11:30 AM (642 Allen Center)
  – Mon. 3-4 PM online (send Scott Yahoo/MS/Google ID)
  – email for appointments at other times

Assignments (tentative)

• Individual
  – 3 written + one talk each

• Group
  – 5 written assignments
    • 3 presentation/demos with the write-ups
  – all group work handed in on Web (group web site)

Books

• The Design of Sites by van Duyne, Landay, & Hong
  – I’ll give you copies of the 4-5 chapters we will use

• We will also hand out other papers, give you web links, & refer to lecture slides

• Recommended textbooks
  – Human-Computer Interaction by Alan Dix, et. al., 3rd edition, 2003
  – order from Amazon.com (link off class web page)

• Other recommended books on web page
Grading

- A combination of
  - midterm (15%)
  - final (25%)
  - individual assignments (15%)
  - group project (40%)
    - demos/presentation (group component)
    - project write-ups and exercises
    - ratings given by other team members & class
  - in class participation (5%)
- No curve

Tidbits

- Late Policy
  - no lates on group assignments
  - individual assignments lose one letter grade/day
- Cheating policy
  - will get you an F in the course
  - more than once can get you dismissed
- More information
  (syllabus/schedule/slides)

Summary

- Project proposal due at start of lecture on Tuesday
- Next lecture on History of HCI
- Read
  - As We May Think by Vannevar Bush
  - Tools For Thought Ch 9 (Engelbart Demo)