






CS 160 Introduction

Professor John Canny
Spring 2006


Outline

-  Who am I?
-  Course Info
-  Administrivia
-  User-Centered Design
-  Projects

Who am I?

 Professor in EECS

 Ph.D. in CS from MIT 1987

 Research in Human-computer interaction, especially:

- * Mobile devices
- * Perceptual interfaces - speech and vision
- * Computer-aided learning
- * Privacy
- * Technology for developing regions







TA

- 📄 Ryan Aipperspach
- 📄 BS in Computer Science from Rice University
- 📄 Graduate student in HCI
- 📄 Interested in designing domestic technology
- 📄 Also doing work in artificial intelligence and sensor modeling
- 📄 Contact info: ryanaip@eecs.berkeley.edu

Course Overview

- 📄 Process of prototyping, evaluating, and designing interfaces
- 📄 Designing for (ordinary) people
- 📄 A course about *design process* as well as technology
- 📄 Team project - Human Centered Design Process

Skills

-  Understanding users and their needs
-  Design ideation
-  Rapid prototyping
-  Evaluation
-  Design evolution
-  Team work!

Course Content

Technical

- * UI toolkits and architecture

Formal Human Models

- * Vision, Memory, Cognition



Design Pragmatics

- * User needs assessment
- * Then prototype->design->evaluate cycles
- * Draws on less formal social sciences - anthropology etc.

What's coming

- 📄 Semester-long team project
- 📄 Next week - your own individual project proposal
- 📄 Team match-making (by us) next week
- 📄 Third week on... team work!

Enrolment

-  If you're not already enrolled, make sure you fill out the petition form from class, and that you're on the waitlist.
-  Please hand the petition forms in to 529 Soda by 10am (this) Friday morning. We'll make the decisions and inform you by email on Friday.

Team Make-up

- 📄 Our goal is to give you some experience in working in an inter-disciplinary team.
- 📄 For this reason, we recruit one non-EECS-major for each group.
- 📄 Target is 10 groups of 5.

Administrivia

John's office hours

- * Tu 2-3, Th 4-5 (529 Soda)
- * email *jfc@cs* for appointments at other times

Teaching assistant

- * Ryan Aipperspach *ryanaip@cs*
- * Office hours MW 1:30-2:30 in 330 Soda

Administrivia (cont.)


Discussion sections

- * Tuesday 11-12, 3-4 in 320 Soda
- * new material covered in section -you should attend

No sections this week

Class ombudsman appointed next class (need volunteer). Relay student concerns to staff.

Books

 Most readings will be online. There is no required textbook for the course.

 Two recommended texts

* Human-Computer Interaction by Alan Dix, et. al., 2nd edition, 1998.

* Designing the User Interface by Ben Shneiderman and Catherine Plaisant, 4th edition, 2005.

 Other recommended books on web page

Grading

A combination of

- * Midterm (15%)
- * Final (15%)
- * Individual assignments (15%)
- * Group project (40%)
 - + demos/presentation (group component)
 - + project write-ups and exercises
 - + ratings given by other team members
- * In-class quizzes (10%)
- * In-class participation (5%)

No curve

Assessment

- 📄 Guidelines will be given in each assignment
- 📄 You should read readings and prepare for class, participation is graded
- 📄 **Good communication** expected in oral and written presentations
- 📄 Midterm and final
- 📄 **Groups self-assess** participation - should monitor it throughout the projects
- 📄 Meet with us as soon as problems emerge

Tidbits

Late Policy

- * no lates on group assignments
- * individual assignments lose 20% per day

Cheating policy (official)

- * will get you an F in the course
- * more than once can get you dismissed from Cal

More information

<http://www-inst.eecs.berkeley.edu/~cs160>

Questions?

Why is UI Design Important?


 In a typical program with a GUI (Graphical User Interface):

- * More than 50% of the code is in the UI, many estimates say 70%!
- * The interface determines the user's experience of the product, and their judgment of its quality.
- * i.e. good UI design sells...

Why is UI Design Important?

- 📄 Usability problems incur *ongoing* costs in support and lost productivity.
- 📄 Supporting a software product usually costs at least as much as developing it - poor UI design sharply increases support costs.
- 📄 Productivity losses are felt at the customer end - difficult to know these but they are huge (\$B's).

Life-Threatening Errors

-  Analysis of transcript of 911 call announcing bomb in Centennial Park at Atlanta Olympics indicated that 10 minutes were needed to call dispatchers
- * Dispatch system required an address for Centennial Park
 - * Dispatch operators could not find anyone who knew address
 - * Bomb was set to go off 22 minutes after call

Life-Threatening Errors

- 📄 American Airlines passenger jet crashed in 1995 into a canyon wall on approach to airport in Colombia killing all aboard
 - * Pilots skipped some of the approach procedures
 - * Pilot typed in "R" rather than full name of airport
 - * Guidance system executed a confusion between the approach procedure and arrival procedure -both beginning with "R"
 - * Plane approached too low and struck canyon wall

Life-Threatening Errors

- Health care providers are increasingly dependent on IT for all their operations.
- Roughly $\frac{1}{4}$ of all Intel PCs go into the Health Care industry.
- No one really knows how many problems occur, except in a few cases - e.g. medication alerts.
- Good UI design is critical to minimize the number of errors.

Who Designs UI's (ideally)

- Best is an interdisciplinary team with **engineering and social science** (e.g. anthropology or psychology), or **Design expertise** (e.g. architecture or ID).
- Sometimes these groups are split, and meet periodically (extreme programming).
- Some engineers become very good at user-centered design, but its not for everyone.

Challenges of UI Design

 First one: understanding user needs

Quick survey

- Have you ever been to a foreign country?
- Think that heavier objects fall faster than light ones (in a vacuum)?
- Throwing a series of tails makes a head more likely on the next toss?
- Do you watch more than 4 hours of TV per day?

"Normal" responses

- Have you ever been to a foreign country? N
- Think that heavier objects fall faster than light ones (in a vacuum)? Y
- Throwing a series of tails makes a head more likely on the next toss? Y
- Do you watch more than 4 hours of TV per day? Y





Average Users are not Like You!


- 📄 About half of Americans read at 8th grade level or lower
- 📄 The median age of the US population is > 35 years, with tremendous growth in over 65s

Average Users are not Like You!

- 📄 One of the biggest challenges in HCI is figuring out the needs of the other 99% of the population.
- 📄 The best way to find out users' needs of course, is to ask them! But this is trickier than it sounds.

Techniques for User Needs

-  Questionnaires, surveys
-  Interviews
-  Observation (ethnography)
-  Contextual Inquiry

-  And (today) personnae

Personae

Personae are fictional characters that you create to represent your user group.



Users: Personae

- 📄 A portrait of a character (with a name)
 - * Name: Jack
 - * Occupation: Professor
 - * Values: liberal politics
 - * Likes: water (swimming, sailing, lying on a beach), Asian food, French food, Italian food, seafood,...
 - * Dislikes: traffic, bad comedians, bureaucracy,
 - * Goals: start family, get good education for kids (probably private), build a leading research group in area,...

Users: Personae

- * Name: Alice
- * Occupation: Just graduated MBA, looking,...
- * Values: Family, friends, work in a humane workplace
- * Likes: Dinner parties, Working out, One quiet night per week, Paris, Lemon drops (drink), foot massages.
- * Dislikes: Chauvinism, aggressive drivers, people who drink more than they should, working after 9pm.
- * Goals: management role in a mid-size company - making it a better place

Personae

More like a **story character** than a description of a community or group

Q: Why the "unnecessary" detail?



Personae

📄 Q: Why the “unnecessary” detail?

📄 A: Narrative detail is **generative**

- * It helps you **generate** design ideas
- * helps you **visualize** the character, and **anticipate** their needs and wants based on all your life experience.
- * It helps **avoid stereotypes** and incorrect assumptions
- * Avoids specifying users in terms of your product e.g “dislikes waiting for music downloads”



Multiple Personae

- With multiple characters, you can explicitly cover a **range** of user traits: age, education, wealth, culture.
- Several personae (e.g. 5-10) will allow you to summarize the breadth of the user community.
- Personae give you a useful shorthand for design choices: Feature X wouldn't work for Alice...





What a Persona is not

- 📄 A description of a real person
 - * but it can be based on real people, just like a story character
- 📄 A description of common traits of a **group** of people
- 📄 A stereotype

Creating personas

- 📄 Is hard to do - like creating a good story character
- 📄 **Exercise** - pick someone you know, and try listing their values, likes, dislikes etc. then ask them as a reality check
- 📄 Helps separate fact from assumption

Next Time

-  We'll create some personae, and use them to help us brainstorm your project ideas.
-  Your individual project idea will be used to build the groups next week.

Projects

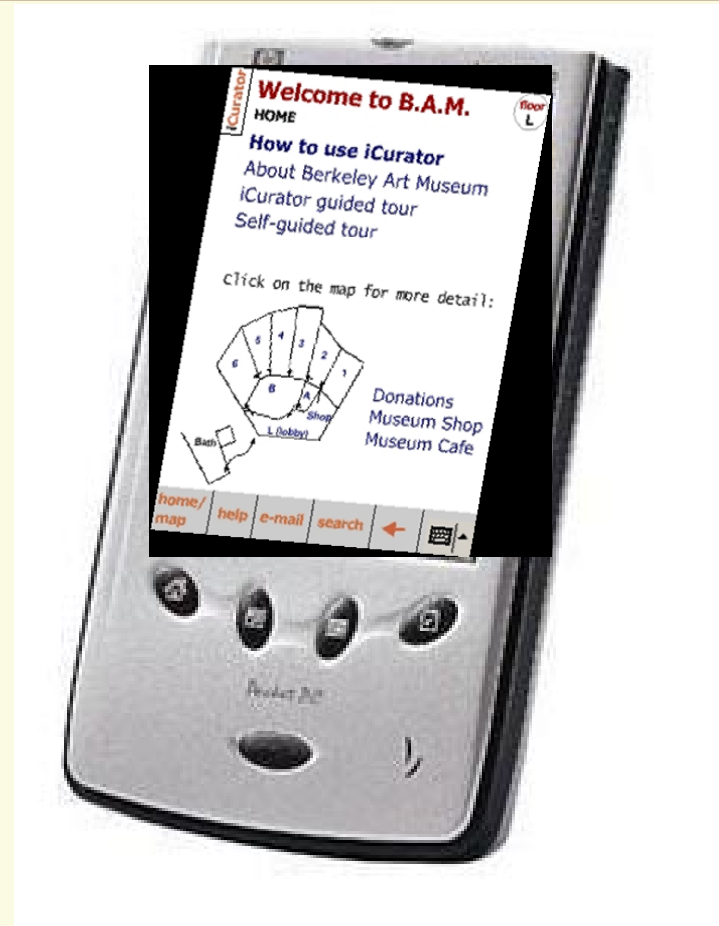
- ☞ This semester we have an emphasis on small device/mobile apps.
- ☞ Your project can have a regular computer interface as well, but part of it should run on the small device.

Why small devices?

- ☞ Many well-compensated IT gurus believe cell phones are the future of computing.
- ☞ Small device GUIs raise many of the challenges of desktop GUIs, only more so.
- ☞ Small device UIs can often use advanced input modes, like speech and gesture.
- ☞ Small device applications can make use of sensing, such as motion, light, sound etc.

Project Examples

iCurator: Intelligent museum guide



Project Examples

📄 iCurator: lo-fi and hi-fi prototypes

WELCOME TO B.A.M. 1

HOME

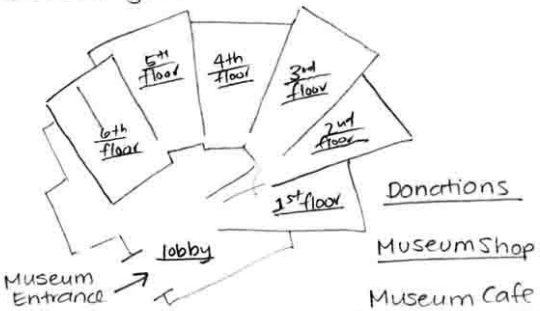
How to use the iCurator

About Berkeley Art Museum

iCurator guided tour

Self-guided tour

Please scan in the barcode nearest you
OR
Choose a point on the BAM map that interests you:



Museum Entrance →

5th floor

4th floor

3rd floor

2nd floor

1st floor

lobby

Donations

Museum Shop

Museum Cafe

>Welcome to B.A.M. floor
L

HOME


How to use iCurator

About Berkeley Art Museum

iCurator guided tour

Self-guided tour

Click on the map for more detail:



Bath

L (lobby)

Shop

A

B

1

2

3

4

5

Donations

Museum Shop

Museum Cafe

home/
map

help

e-mail

search

←

⌂

Project Examples

PHAT: Personal Healthcare and Tracking

The screenshot shows the PHAT web application interface. At the top is a blue header with a white plus sign and the text "PHAT Personal Healthcare And Tracking". Below the header, a navigation menu includes "Home", "Log Out", "(John Smith)", "My Profile", and "Help". Three main management buttons are visible: "Medicine Manager", "Appointment Manager" (highlighted with a "You Are Here" indicator), and "Records Manager". The "Appointment Manager" section features a table with columns for Date, Time, Location, Staff, Reminder Method, Comments, and Operations. A single appointment is listed for 5-4-2004 at 12AM at Tang, staffed by Dr. Jones, with an email reminder method and the comment "Be on time, leave class early... :)". Below the table is an "Add" button. The footer of the application displays "CS 160 Group 5".

Date	Time	Location	Staff	Reminder Method	Comments	Operations
5-4-2004	12AM	Tang	Dr. Jones	Email	Be on time, leave class early... :)	Edit Delete

Project Examples

- 📄 Newsalert: Context-aware notification for smart phones
- 📄 Based on Qualcomm's BREW API
- 📄 Related: Stock Alert and Context-awareness



Summary

- ☞ Good UI design is an inter-disciplinary process
- ☞ It starts with user needs assessment, which personae can help with
- ☞ Note: review quizzes start next week, at the beginning of class
- ☞ Hand in petitions by Friday 10am, we will email you with results on Friday