CS5340
Human-Computer Interaction

September 14, 2016

Today's Class

- Administrivia
- Interaction Design
- Data Gathering / Interviewing
- Lab 1: Interviewing
- For Next Week

----Break midway-----

Administrivia

- www.ccs.neu.edu/course/cs5340
- Slides on website
- Class Discussions + Questions
  - Piazza
- Teams
  - Finalize during break
- In-class questions
  - Before class, during break

Administrivia

- Team project
  - MONUM presentation next week
  - Interview logistics: coming soon
  - Boston Home Center classes: visiting – **Coordinate with Charlotte**

Boston Home Center classes

September 21
6:00PM-8:30PM
Mildred Av Community Center
5 Mildred Av- Mattapan

September 22
5:30PM-8:00PM
Winter Chambers
26 Court St – Boston

September 17
10:30AM-4:00PM
(stay for part)
Charlestown Community Center
255 Medford St – Charlestown

Sept. 19
6:00PM-8:30PM
Holland Community Center
85 Olney St – Dorchester

Administrivia

- Hot Topics
  - Sign up for one slot on Blackboard (by Friday)
    - Course Tools → Wikis → Hot Topics Sign Up
  - Contributes to class participation grade
- Team project
  - MONUM presentation next week
  - Boston Home Center classes: visiting
  - Interview logistics: coming soon

Intro

INTERACTION DESIGN

Human-computer interaction is a discipline concerned with

the **design, evaluation and implementation** of **interactive** computing systems for **human use**

and with the study of **major phenomena surrounding them**.

ACM SIGCHI Curricula for HCI

WHAT IS HCI?

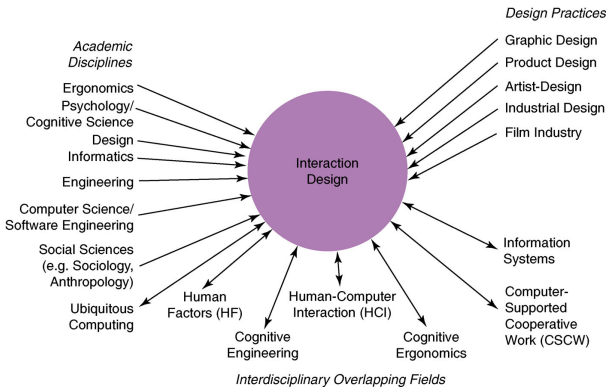
What is HCI?

- Interactive computing design & development
  - GUIs
  - Mobile & ubiquitous computing
  - Speech interfaces
  - Touch interfaces
  - Social computing
  - …
- Empirical studies of UIs
  - Qualitative, quantitative, mixed, design-based

What is HCI?

- Design… but what do we mean?
  - Interaction Design
    - "designing interactive products to support the way people communicate and interact in their everyday and working lives" [PSR]
    - Enhance & augment
    - What's on the screen, but more…

HCI and interaction design

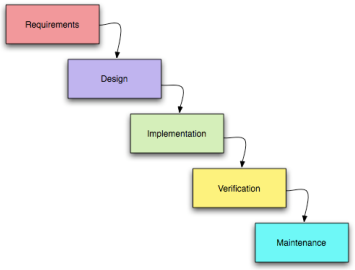


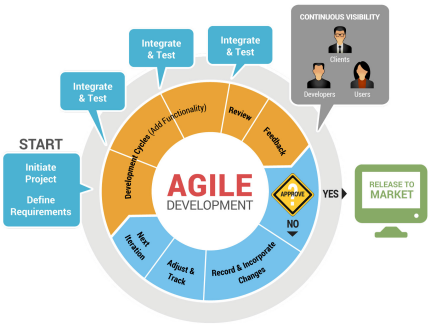
ID: "the theory, research, and practice of designing user experiences for all manner of technologies, systems and products

HCI: "a narrower focus"

How do we design software?

- Your experiences – what steps involved?



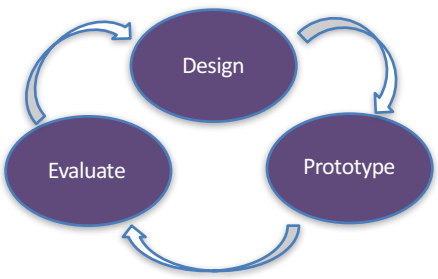


Agile & UCD

- Agile
  - Iterative
  - Incorporating feedback
  - Primary measure of progress: working software
  - Priority: satisfy customer
  - A software engineering philosophy
- UCD
  - Iterative
  - Incorporating feedback
  - Primary measure of progress: useful, usable, meaningful software
  - Priority: satisfy end-users
    - Often deeper, more varied end-user research: formative + summative
  - An interaction design philosophy

How do we design software?

- An IxD/UCD approach?
  - experience design
  - how to get there
  - what happens after you've designed the tool



How can we know if a UI is a "good" one?

- Usability
  - Objective measures
  - Perceived utility, ease of use and efficiency + much more
- and what else?
  - User *Experience*
    - Users' subjective engagement with technology
    - affect, meaning, values, how a system *feels*
    - Satisfying, enjoyable, motivating, aesthetically pleasing, rewarding, etc.

What is interaction design?

What is interaction design?

"It is **not enough** that we build products that function, that are understandable and usable, we also need to build joy and excitement, pleasure and fun, and yes, beauty into people's lives"

Norman, Donald A. "Introduction to this special section on beauty, goodness, and usability." Human-Computer Interaction 19.4 (2004): 311-318.

Useful
does what's required

Usable
natural, productive interaction

Used
people want & enjoy interaction

identifying user needs, desires & values →

Designing for the user experience

Usability
Functionality
Aesthetics
Content
Sensual & Emotional appeal

Social capital
Cultural identity
Health
Family dynamics

When preparing to design…

- What factors do we need to take into account?
  - Who the users are
  - Strengths, challenges, needs
  - What activities/tasks are being carried out
  - Where the interaction is taking place
  - Values
  - Utility, usability & experience goals

Banking Design

- How does banking differ when using:
  - ATM
  - Mobile banking app
- Consider the kinds of user, type of activity and context of use

What is involved in the process of interaction design

- Establishing requirements
- * **Developing alternatives**
- Prototyping
- Evaluating

Core characteristics of interaction design

- users should be involved through design & development
- specific usability and user experience goals need to be identified, clearly documented and agreed to at the beginning of the project
  - Will likely evolve
- iteration is critical

Why go to this length?

- Help designers:
  - understand how to design systems that fit with wants, needs and desires
  - appreciate that one size does not fit all
    e.g., teenagers are very different to grown-ups
  - Identify incorrect assumptions
    - e.g., not all elderly individuals want or need big fonts

DATA GATHERING

When preparing to design…

- What factors do we need to take into account?
  - Who the users are
  - Needs
  - What activities/tasks are being carried out
  - Where the interaction is taking place
  - Values
- Establish requirements
  - Functional
  - Non-functional (usability & UX goals)

Five key issues

1. Setting goals
   - Research questions, hypotheses
2. Identifying participants: Sampling
   - Probability
     - random selection
     - participants have equal chance of being selected
     - permits generalization to larger population
   - Non-probability
     - purposeful sampling
     - selecting information-rich cases to study in-depth, who will help vividly illuminate studied phenomena

Five key issues

3. Relationship with participants
   - Clear and professional
   - Informed consent when appropriate

4. Triangulation
   - Look at data from more than one perspective
     - Sources / places / people
     - Investigators
     - Methods

5. Pilot studies
   - Small trial of main study

Human Subjects Protection

- Institutional Review Board
  - Protect the rights &welfare of human subjects who participate in research
  - Assess & evaluate the risks & benefits of proposed research
  - Ensure that risks to human subjects are kept to a minimum
    - and are justified by potential benefits of the research.

Human Subjects Protection

- Institutional Review Board
  - Ensure information obtained from subjects is kept confidential
    - to the extent allowed by law.
  - Ensure that, where appropriate, Informed Consent is obtained from each subject

Data Gathering

- Many techniques
  - Interviews
  - Observations
  - Surveys
  - Diaries
  - Experience Sampling
  - Eye gaze tracking
  - System Logs
  - …

Epistemology

- Branch of philosophy
  - The grounds and nature of knowledge
  - What is knowledge and how can we acquire it?
  - How can we know about the world?
- What does the theory of knowledge have to do with HCI?
  - HCI is largely empirical
  - Must understand different perspectives on how knowledge can be obtained
- 2 broad positions
  - Positivism, interpretivism

Positivism

- Derived from natural sciences
- Search for **objective** "laws" or "facts"
  - Attempts to explain the world e.g. gravity
  - Scientific method: hypothesis testing, experiments
  - Social world operates like physical world
  - Developing the "laws" that govern human action and interaction

Interpretivism

- A reaction to positivism
  - Asks and answers different types of questions
  - Truth is not absolute, but decided by human judgment
- Understanding "meaning" of action from actors' perspective
  - Necessarily subjective
  - Often employs qualitative methods

Quantitative & Qualitative

- Quantitative Methods
  - Strongly support collection of positivist-oriented data
  - Measurement
  - producing numerical data about trends (with confidence)
  - Tell us **what** people do, and **that** they do it
  - E.g., experiments
- Qualitative Methods
  - Strongly support the collection of interpretivist-oriented data
  - Descriptive (words, pictures, etc.)
  - Understanding **how** people think, the **whys of** behavior
  - E.g., ethnography

Analysis

- Qualitative and Quantitative
  - independent of epistemology
- Can pursue interpretivist questions quantitatively
  - E.g., numeric results from qualitatively collected data

Qualitative Methods in HCI

- Desire to go beyond positivist methods
  - Predictive models
  - Experimental lab testing
  - As in social sciences, desire to go "in the wild"
- Rich account of context, behaviors, values, desires, etc.
- Identification of opportunities to (not) design

Interviewing

- What it involves
  - Data collection (recordings & field notes)
  - Interpreting what's been seen (analysis)
- How different from normal conversations?
  - 1-way systematic questioning
  - Continual probing
  - Data gathering to answer a RQ
  - Systematic analysis

Interviewing

- Find out what we cannot observe
  - Feelings
  - Thoughts
  - Intentions
  - Meanings & Orderings attached to the world
  - Non-public interactions
- Understand the things we have observed
- "The perspective of others is meaningful and knowable and can be made explicit"

Interviewing

- You are a research instrument
  - In addition to the interview guide
  - Quality of data: largely tied to interviewer
- 2-way relationship
  - You are being assessed
  - You are assessing
- Goal: create an environment that leads interviewee to want to share
  - Rapport

10 Interview Principles

1. Ask open-ended questions *Invite thoughtful & in-depth responses*	**6. Be both empathic & neutral** *Non-judgmental interest & encouragement*
2. Be clear *Focused, understandable questions*	**7. Make transitions** *Guide interviewee through process*
3. Listen *Attentiveness, let them know they're heard*	**8. Distinguish types of questions** *Behavior, Attitude, knowledge, etc.*
4. Probe as appropriate *Follow-up on incomplete responses*	**9. Be prepared for the unexpected** *Be flexible & responsive*
5. Observe *Adapt as appropriate*	**10. Be present throughout** *Show interest, minimize distractions*

Interviews: Approaches

- Structured
  - Stick to the Interview Guide
  - Know what you want answered (be careful)
- Semi-structured
  - Interview guide, but deviation encouraged
  - Somewhat know what you want answered
- Unstructured
  - No guide, based on interactions, conversational
  - Unsure what will be of interest

Interviews

- Interview Guide
  - Assure same lines of inquiry pursued w/each interviewee
  - Probe to explore each topic
  - Focus discussion w/in time constraints
  - Structured guides
    - multiple interviewers
    - less-experienced
    - time constraints
    - limit exploration of unexpected topics, individual differences

Interview Elements

- Questions
  - Grand-tour
    - "What were your overall impressions…"
    - Easily-answered questions
    - Get participant used to talking
    - Give you topics to follow-up on
  - Directed queries
    - about a topic that you pose
  - Prompts / Probes

Types of Questions

- Closed- vs Open-ended
- Story
  - "Tell me about the last time you…" vs. "Do you ever…"
- Role-playing & simulation
  - Supports mental visualization, provides context (vs abrupt questioning)
- Presupposition
  - Creates rapport through shared knowledge
  - Encourages respondent that they have valuable knowledge to contribute
- Final/Closing

Types of Questions

- Experience & Behavior
  - What they've *done*, what they *do*
- Opinions & Values
  - What do people *think* about X, assessments
- Feeling
  - How do people *feel* about X
  - Watch for?
    - Opinion answers
- Knowledge
  - Factual
- Sensory
  - What is seen, touched, smelled, tasted, or heard
- Background/Demographic

Interview Elements

- Sequencing: Start with?
  - easy, uncontroversial
  - Experience → Feelings, Knowledge
    - More grounded & meaningful responses when people have "relived" experience
  - Present → Past
    - Easier to answer
    - Provides baseline

Truly Open-Ended

- *How satisfied are you with the Facebook "Like" feature?*
  - Restricts participants from choosing from all responses they think are salient
  - How do you feel about the Facebook "Like" feature?
- Qualitative inquiry
  - Minimize imposition of predetermined responses
  - Goal: determine dimensions, themes, etc. they use to describe feelings/thoughts/experiences
  - Avoid yes/no questions, unless used as precursors to follow-ups

Singular

- Tell me what you usually do when you login to Facebook and what features are the most enjoyable for you to use?
  - Tell me what you did the last time you went onto Facebook.
  - How does this experience compare to other times you have logged into Facebook?
  - Thinking back onto the Facebook features that you have used, are there any features that you find enjoyable to use?
- Thoughtful, focused and distinct

Clarity

- Helps establish rapport
  - Unclear = uncomfortable
- Familiarize yourself with the vernacular
  - Home buying, Boston Home Center…
  - Use caution with labels
  - Words that make sense to interviewee
- Reflect his/her worldview

"Why?"

- Why do you use Snapchat?
- Avoid "Why" questions
  - Typically many contributing factors
  - Can imply a response was inappropriate
  - Yields wide-ranging responses (difficult for analysis)
- What to do?
  - Tease out the causal level of interest

Neutrality

- Nonjudgmental
  - Stance re: content
  - No signs of favor or disfavor
  - No: shock, anger, sadness
- Illustrative examples
  - "I've heard it all"
  - Demonstrate *multiple dimensions* to avoid leading
- "empathic neutrality"
  - Neutral to content, caring towards person
  - Understand & empathetic to a person's perspective without judgment
  - Build trust, openness, rapport

Neutrality: Avoid Leading

- "Do you like the public transit suggestions in Google Maps?"
- "A lot of people have told us they would like the transit options to better communicate delays. What do you think?"
- Directing participant to say what you want to hear
  - They may do this anyway, be on guard
- Instead, say
  - "What were your impressions of X feature"
  - "Anything you would change?"
  - "Anything you liked, if not that's fine…"

Prefatory Statements

- Alert interviewee to what is going to be asked
  - Directs awareness & focuses attention
  - Gives time for respondent to organize thoughts

Prefatory Statements

- Transition
  - A section/topic is complete & a new one is about to begin (We've talked thus far about…)
  - Summarizing transition (I'd like to summarize what I've heard…)
  - Direct announcement (Let me ask you to think about,…)
  - Attention-getting (The next question has been a bit controversial…)

Probes

- Deepen question response
- Cue interviewee to level of desired response
- Don't call it a probe
- Picking up on things said
  - Pre-determined categories of inquiry
  - in passing: "markers"
    - You feel there may be something worth following up on
    - Exploratory

Probes

- Getting to details
  - Who, what, where, when, how?
  - Tell me more
  - Gentle nodding
    - not too enthusiastic, this = endorsement
  - Clarification.
    - "You said it's sometimes annoying. Can you say more about that?"
    - Interviewer assumes fault
  - Contrast
    - How does looking for a healthy meal in your neighborhood compare to looking for healthy meals in other Boston neighborhoods?

Providing Feedback

- Let interviewee know how things are going
- Provide reinforcement & feedback
  - Purpose of interview is being fulfilled
  - Words of thanks, support, praise
  - "Your comments about X are very helpful"
  - "We're about halfway done and this is going really well from my perspective. How is it going for you?"
  - "I really appreciate your willingness to share that."

Maintaining Control

- Be clear what you want to learn
- Staying on time & on-topic
  - Allow for some divergence (open-ended)
  - Attentively listen for relevance & quality of response
    - Depth
    - Answering question?
- Long-winded responses
  - Give verbal + nonverbal feedback
  - Stop nodding
  - *Respectfully* interrupt
  - Redirect attention

Taking Notes

- Record when possible
  - Allows you to be more attentive
  - Take focused notes
    - Backup
    - Help formulate new questions
    - Highlight early insights to probe later
    - Key phrases, insights
    - Indicate when in interviewees' own words
- If not possible
  - Record quotes
    - Be particularly accurate on important points

After the Interview

- Make sure recording worked
  - If not, take extensive notes immediately
- Make sure your notes are complete
  - Expand with your reflections: immediately after
  - Beginning of analysis
  - Insights are fresh
- Follow-up with interviewee on unclear points

Bias

- You are a research instrument
  - You collect data
  - Their experiences filtered through your mind
- So what to do?
  - Be explicit
    - about your assumptions, biases
    - about your process (method, analysis, etc.)
  - Triangulation
  - Member checking
  - Sampling
  - Practice

Critical Sensitivity to…

- unique culture of environment
- respect for person
- person's time
  - Glances at watch
  - Looks
- not talking, but listening
  - You should be MOSTLY listening!
- having person feel in control

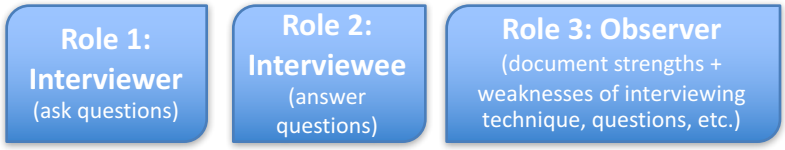
- **You are there to LEARN from interviewee**

Lab 1
Interviewing

RQ1: What are students' perceptions of the Boston housing market (rental & ownership)?

RQ2: How well do existing resources help students obtain housing?

- In groups of 3
  - Each student: prepare 3 interview questions & probes



  - Rotate twice
  - Report back: 1 area for improvement, strength, or ?

Types of Questions

RQ1: What are students' perceptions of the Boston housing market (rental & ownership)?

RQ2: How well do existing resources help students obtain housing?

- Experience & Behavior
- Opinions & Values
- Feeling
- Knowledge
- Sensory

To Do for Next Week

1. Post interviewing lab reflection by Friday, 6pm
   - Blackboard ☾ Discussion Board ☾ Forum: Lab Reflections ☾ Thread: Lab 1--Interviews
   - Late posts will receive a grade deduction
2. Due
   - I1 (9/21, 6pm)
   - T1 (9/23, 6pm)
3. Read
   - Interaction Design (PSR Ch 9)
   - Identifying the Problem Space (PSR 2.1-2.2: pp 37-41)

Research Paper

- How to read a research paper
  www.eecs.harvard.edu/~michaelm/postscripts/ReadPaper.pdf
- Action Research (Hayes) reading: on Blackboard
- Research Paper Circles: Roles
  - On course website: www.ccs.neu.edu/course/cs5340/papers.html
  - Related work: Google Scholar, ACM Digital Library, …
- Paper Response: Due Wed 9/21, by 6pm
  - Blackboard → Discussion Board Forum → Forum: Research Paper Reflections