cpsc 344: introduction to HCI methods

final exam review
Announcements

- Final exam will cover material from all lectures, but will focus more heavily on post-midterm material.

- Will be circulating thank you cards for industry panelists – please sign if you attended the panel.

- Interested in a (possible) paid opportunity to help improve 344 course materials (e.g. website, project docs)? Send Paul & Juliette an email with a short blurb about your qualifications.
Learning goals by week
W01/2: how interfaces fail

• begin to understand the world in terms of choices that designers have made

• explain the relationship between the myth of human error and the goals of human computer interaction

• list concepts / heuristics / principles for good/bad interface design

• be able to identify and critique interface strengths and weaknesses in terms of this language

• explain the difference between technology-centered vs. human-centered design
W02: design principles

Same as previous page plus…

• **describe** the **stages** of the HCI process and different types of **goals** each might have

• **define** and **identify** **stakeholders**

• start to develop **evaluation goals**
For each of the above evaluation techniques:

- explain **when and why** they may be an appropriate evaluation technique choice; discuss their pros & cons

- outline important **considerations for designing and conducting** a questionnaire/interview/observation

For interviews and questionnaires:

- list different **styles of questions** (open, closed, Likert, etc.) and give examples of what they are appropriate for;
W03: planning evaluations

• develop focus and goals for pre-design activities
  – (e.g. identify human activity needing support, stakeholders, central tasks)
• explain what it means to triangulate in data gathering and evaluation
• make and justify strategic decisions in evaluation planning
W04: mental models

define mental models, describe their characteristics.
give examples of how a mental model can be acquired

explain what Norman’s 7-stage model is good for:
use gulfs/stages to analyze interactions with a system

be able to identify a mismatch in mental models
give examples of situations or interfaces where mismatch occurs

explain the difference between internal and external cognitive frameworks

- give examples of the types of factors or representations that could be important when analyzing distributed/external cognition
- give examples of external representations that help with memory load reduction, computational offloading and cognitive tracing
W04: human abilities

- **List and describe** models we have of human abilities (cognitive resources and memory, sensory processing)
  - Model human processor, theories of memory
  - related concepts: interference, reasons for forgetting, change blindness, S-R compatibility, etc.

- **Describe** implications and considerations for design that result from these models, and that consider both visual and physical attributes;
  
  e.g., recognition vs. recall, facilitating retrieval, time limitations. chunking, visual attributes (grouping, proximity, differentiation, separation, progression)

- **Give examples** of interface features that illustrate these implications; critique interfaces using them

- **Give examples** of impairments and individual differences that impact human abilities (visual, motor, cognitive, etc.)
W05: data and analysis

• describe the difference between **data types** in terms of subjective/objective and qualitative/quantitative;

• be able to give examples of each combination of data types on the spectrum for different analysis techniques

• describe methods for performing **qualitative analysis**, including the process and outcomes involved in each

• describe some simple techniques for **quantitative analysis**
W06: task examples

• outline the steps in task centered design
  – explain how it may differ from other design process, and describe its strengths and limitations

• list the elements and characteristics of a good task example, and demonstrate these when writing task examples

• be able to “walkthrough” an interface design using a task example
W06: requirements

• define and give examples of different types of requirements

• compare/contrast: task description, need, problem statement, requirement, specifications, metric? Provide examples you can defend.

• give examples of HCI techniques (e.g. evaluation, prototyping, modeling) that are suitable / helpful for setting requirements

• be able to identify appropriate metrics for a given requirement (and outline what features good metrics have)

• explain 3 steps for requirements generation
W07: conceptual models

• explain the purpose of a **conceptual model** and how it differs from a **user’s mental model**.

• **explain the difference** between a conceptual model and an interface design

• what are the risks and limitations of getting conceptual design wrong?

• list some of the **components** a conceptual model should include (e.g. metaphors, interaction types, objects/attributes, etc.); given a scenario, identify examples of each;

• give some examples of way you could visualize a conceptual model
W08: lo-fi prototyping

describe the relationship between conceptual design and interface design, and why the distinction is important.

for a given situation, assess and explain why, when, what, and how you may want to prototype.

explain how prototyping fidelity relates to design progression; and give examples of what prototypes at each stage might involve.

describe different approaches to creating low fidelity prototypes (paper prototypes in particular).

explain the benefits and drawbacks of low fidelity prototyping (paper prototyping in particular).
W09: cognitive walkthroughs (CW), heuristic evaluations (HE)

• explain why CWs and HEs are considered discount usability methods

• **describe the pros/cons** of CWs and HEs, and explain when each method is an **appropriate choice** of for an evaluation

• describe the kinds of things that CWs and HEs can assess

• outline the **general procedure** for a CW and HE (and be able to do it yourself)
W10: med-fi prototyping

• list **dimensions** of prototyping fidelity and explain how these dimensions may vary;

• explain **how these dimensions might differ** in low to med to high fidelity prototypes, and give examples of when/why you may use each type

• make **strategic choices** about prototyping tools given your goals and constraints; be able to justify your choice.
W10: usability testing

• explain when usability studies are typically conducted, why they’re conducted, and what you might try to learn
  – give examples of locations, tasks, metrics, evaluation methods that might be involved

• experience in analyzing a reported usability study
W11: visual design

• Explain why visual design is important and useful to consider when building interfaces

• Describe visual hierarchy, visual flow proximity and grouping, positive/negative space, and how they are related to one another

• List the gestalt principles of closure, continuation, similarity, and proximity, and briefly explain the differences between each

• Give examples of how all of the above can be achieved effectively using visual cues

• For a given design: identify examples of the above concepts and critique their effectiveness in that design
W11: typography and colour

• describe basic typographic concepts
  • e.g., x-height, cap height, ascender, descenders, baselines, serif/san-serif, measure, line spacing

• explain and give examples of how these typographic concepts influence readability and legibility

• describe and give examples of some basic guidelines for choosing colors
Learning goals for the project

- Be able to describe the stages of design that you practiced
- Be able to plan and justify an evaluation and/or prototype appropriate to your stage of design
- Be able to compare and contrast the advantages and disadvantages of different evaluation or prototyping techniques
- Be able to appropriately choose the number and kind of participants for different evaluation techniques
- Be able to develop and justify requirements
- Be able to come up with evaluation goals that are measurable, specific, and high-level
- Be able to analyze qualitative and quantitative data for common themes, summary statistics, etc.
- Develop task examples that expose requirements
activity:
practice final exam question