## CS464 Review for Test 2 – Part 1

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What are the benefits of tangible representations?
Ans: Tangible Representations

• Offload cognition into environment
• Reflect on and evaluate the design
• Gather feedback from stakeholders
• Discover unintended side effects (positive/negative) of the design idea
Ques: Low Fidelity Prototypes

How did we define these?
Ans: Low Fidelity Prototypes

• Anything hand-drawn
• Anything paper/cardboard, etc.
• Anything that doesn’t look like an app when you start it up
Ques: Prototype Benefits

Why prototype?
Ans: Prototype Benefits

- Fast, cheap, broader design palette than computer-based tools
- Encourages iteration
- People are more apt to evaluate something that doesn’t look “done”
- Can iterate on-the-fly
- Helps communicate intents
Ques: High Fidelity Prototypes

What is a high-fidelity prototype?
Ans: High Fidelity Prototypes

• Nearly identical to proposed production version
Ques: Types of Prototypes

Besides low and high fidelity, what is the other dimension of prototypes?
Ans: Types of Prototypes

- **Horizontal**
  - Broad overview of the system
- **Vertical**
  - Detailed prototype of one small part of the system
Ques: WoZ

What is a Wizard-of-Oz in HCl?
Ans: WoZ

• Demonstration or evaluation technique
• Person fills in for computation
• Different system states already built or created on-the-fly based on what the user does
What are the goals and tools of design interaction?
Ans: Interaction Design

Goals:
To engineer the interaction with the system from the user’s perspective
Input/Output
Guide how the user will use the system

Tools
Scenarios and storyboards
Mental models of interaction
What happens if a designer and the end user have mismatched conceptual models of a system?
Ans: Conceptual Models

Mismatches cause gulfs of execution and evaluation
Ques: Gulfs

What are the 2 gulfs we talked about (names and their definitions)?
Ans: Gulfs

• Gulf of execution: the user has goals and it isn’t clear how to get the system to function to achieve them

• Gulf of evaluation: it isn’t clear that the system has achieved the user’s goals
What are the 6 UI design principles we talked about?
Ans: UI Design Principles

• Affordances
• Mapping
• Constraints
• Visibility/feedback
• Consistency
• Metaphors
Ques: Why Simplicity

What are 3 reasons we strive for simplicity?
Ans: Why Simplicity

• Simple designs present the minimum amount of information to achieve maximum effect
• Simplicity leads to quickly recognized and understood functionality
• Simplicity can aid recall
Ques: How Simplicity

How do we achieve simplicity?
Ans: How Simplicity

• Reduce, reduce, reduce
• Reduce some more
• Reduce until it hurts
• Regularize
What are 4 characteristics of organization and structure?
Ans: Organization and Structure

• Grouping
• Hierarchy
• Relationship
• Balance
What are ways to achieve each of the 4 characteristics?
Ans: Achieving Organization/Structure

- Grouping – Gestalt principles
- Hierarchy – guide viewer using size, position, spacing, white space
- Relationship – establish using position, size, value (color, shape), alignment, form similarity
- Balance – create visually stable composition using properties like position, size, hue, form, symmetry
Ques: Common Errors

What are 4 common errors in organization and structure?
Ans: Common Errors

- Haphazard layout
- Not taking proximity into account
- Unclear hierarchy
- Bounding boxes creating visual clutter
Ques: Gestalt Principles

What are the 6 Gestalt grouping principles we talked about?
Ans: Gestalt Principles

- Proximity (nearby elements associated)
- Similarity (elements with visual characteristics associated)
- Continuity (visual system prefers continuous, unbroken contours)
- Closure (visual system will create a complete picture)
- Area (smaller of 2 overlapping elements becomes object of interest)
- Symmetry (the greater the symmetry, the more we ascribe meaning)
Ques: Gestalt example 1

Which principle does this example show?
Ans: Gestalt example 1

Area: Figure is element of interest, ground is area on which it rests

• Smaller of 2 overlapping elements is the figure and larger is the ground
• Darker objects appear more often a figures with lighter areas as ground
Ques: Gestalt example 2

Which principle does this example show?
Ans: Gestalt example 2

Symmetry
Ques: Gestalt example 3

Which principle does this example show?
Ans: Gestalt example 3

Continuity - Will seek out simplest possible explanation for abstract drawings
Ques: Gestalt example 4

Which principle does this example show?
Ans: Gestalt example 4

Closure
Ques: Gestalt example 5

Which principle does this example show?
Ans: Gestalt example 5

Similarity
Ques: Gestalt example 6

Which principle does this example show?
Ans: Gestalt example 6

Proximity
Ques: Gestalt example 7

Which principle does this example show?
Ans: Gestalt example 7

Area: Figure/Ground
What is the iteration cycle?
Ans: Iteration Cycle

1. Collect data
2. Understand needs
3. Design to the needs
4. Evaluate

The cycle continues indefinitely until all needs are satisfied.
Ques: Evaluation definition

What are we trying to do during evaluation?
Ans: Evaluation definition

Find out how well the system is meeting the goals and needs of users; how well it is accomplishing what we intended.
Ques: Evaluation Types

What are the 2 types of evaluation and when are they used?
Ans: Evaluation Types

• Formative for when a system is being designed and developed so that feedback can be incorporated into the design process.

• Summative after a system is complete to find out how well the system meets goals previously set.
Ques: **Evaluation Critical Concepts**

What are the 3 critical concepts we talked about that apply to any evaluation?
Ans: Evaluation Critical Concepts

*Reliability* of a study/test/measure: Can you repeat it and get same results every time?

*Validity* of a study/test/measure: Is what you claim you’re measuring actually what you are measuring?

*Ecological validity*: How close testing environment is to actual environment
Ques: Eval Plan Purpose

Why do we develop an evaluation plan and follow it?
Ans: Eval Plan Purpose

To ensure critical evaluation concepts – reliability, validity, and ecological validity of the evaluation findings
Ques: Eval Plan parts

We talked about 6 parts to an evaluation plan. What are the first 4?
Ans: Eval Plan parts

1. Identify *specific goals* of system
2. Decide what *questions* should be answered. Answers need to tell you how well you’ve met the specific goals
3. Identify specific *metrics* and *measures* to assess success of reaching goals and of answering questions. Address some validity issues here; is what you measure going to really answer the question? Also think about reliability; can you repeat the results?
4. Choose one or more *evaluation techniques*. Think about validity again; are you measuring what you think you are measuring? Identify potential *biases* and how you might mitigate them
5. Decide *where* to run evaluations. Related to ecological validity
6. Decide *who* will participate in evaluations. Related to validity again
Ques: Evaluation Paradigms

What are the 4 evaluation paradigms we talked about?
Ans: Evaluation Paradigms

“Quick and dirty” evaluations
Usability testing
Field studies / naturalistic studies
Analytical evaluations
Ques: Evaluation Techniques

What are the 5 specific evaluation techniques we talked about? Which paradigm are they part of?
Ans: Evaluation Techniques

Think-aloud – Quick and Dirty evaluation
Experiment – Usability testing
Observations – Field/Naturalistic studies
Heuristic evaluation – Analytic evaluation
Cognitive walkthrough – Analytic evaluation
Ques: Experiment example 1

What, if anything is dubious about the following?

“Results from our tests indicate it took the user 30 seconds, on average, to input a new entry into the database. We have data from the old version of our interface which showed an average of 2 minutes for this same task. Thus we conclude that the new interface improves the average time needed to perform this task.”
Ans: Experiment example 1

Probably OK, but maybe subjects were way different or were the same and had learned. These would be confounds.

Validity
Are we measuring what we say we are measuring?

Reliability
If we run the experiment several times, do we get the same results every time?

Confounds
Are there variables we didn’t control for which may be influencing the results we’re obtaining?
Ques: Experiment example 2
What, if anything is dubious about the following?

“To test our interface, subjects performed 10 tasks using the current interface. Subjects also performed the same 10 tasks using our new interface. We randomized subjects so that on average half of the subjects started with the current interface and half with the new interface. Results indicate that our new interface improved task performance by 70%.”
Ans: Experiment example 2

Probably OK

Validity
Are we measuring what we say we are measuring?

Reliability
If we run the experiment several times, do we get the same results every time?

Confounds
Are there variables we didn’t control for which may be influencing the results we’re obtaining?
Ques: Experiment example 3

What, if anything is dubious about the following?

“We performed an experiment where we added shortcut keys and type-ahead capabilities to our application. Our users are 50% faster because of the type-ahead feature.”
Ans: Experiment example 3

Validity is an issue since there are 2 independent variables so we don’t know which we are measuring.

Validity
Are we measuring what we say we are measuring?

Reliability
If we run the experiment several times, do we get the same results every time?

Confounds
Are there variables we didn’t control for which may be influencing the results we’re obtaining?
Consider this statement:
“If I use pie menus rather than vertically-oriented context menus, users will be able to select items faster”

1. What are the independent variables?
2. What are the dependent variables?
3. What experiments must be run?
Ans: Variables

1. Pie menus and context menus are the independent variables
2. Item selection is the dependent variable
3. Test pie menus and selection time and context menus and selection time
Ques: Study Designs

What are the 2 experimental study designs we talked about (they have to do with subjects)?
Ans: Study Designs

- **Between-subjects**
  - Each subject exposed to only one condition

- **Within-subjects**
  - Every subject experiences every condition (control and experimental)
  - Order of conditions usually counterbalanced to counter learning effects
Ques: Biases

What are the 4 types of biases we talked about? Which should you be sure to take into account?
Ans: Biases

Hawthorne effect/John Henry effect – motivational effect of interest being shown

**Experimenter effect/Observer-expectancy** effect – you see what you expect to see

Placebo effect – if a person thinks something may be better then it is perceived as better

Novelty effect – performance is better when new tech is introduced

Can’t completely control for biases.

Assume subjects are trying to be helpful, so they are being nice in their evaluations
What are the 2 types of survey questions we talked about?
Ans: Survey Ques Types

• Open-ended:
  – biggest variety of answers
  – take a long time to ask and analyze
  – often skipped by users

• Closed-ended:
  – must be carefully worded so respondents interpret them the same way
What are the 3 goals of every survey question?
Ans: Survey Question Goals

1. Measure the underlying concept of interest
2. Don’t measure anything else
3. Interpreted the same by all respondents
Which of the following are good tips for a survey?

- Create a clear hypothesis that is testable using your survey.
- Survey lots of people.
- Don’t bother testing your survey; it’ll give OK results no matter what.
- Long questions and long answers and long surveys give more data.
- Do NOT require respondents to answer questions, especially ones regarding private information.
- Question order – people are impacted by previous questions:
  - Start with introduction
  - Ask sensitive questions (e.g. demographics) next
  - General questions first
  - Randomize questions to get better data across the responders
  - Give all questions to each respondent even if they aren’t applicable
Ans: Survey Tips

- Create a clear hypothesis that is testable using your survey.
- Concentrate on surveying a representative sample of the population rather than lots of people.
- PRE-TEST, then REFINE, then TEST AGAIN!!!
- Keep it short. Long questions and long answers and long surveys decrease the chance of getting results.
- Do NOT require respondents to answer questions, especially ones regarding private information.
- Question order – people are impacted by previous questions:
  - Start with introduction
  - General questions first (easy to answer), BUT do NOT place questions out of order or context
  - Ask sensitive questions (e.g. demographics) near the end
  - Randomize questions to get better data across the responders
  - Only give questions applicable to each respondent
Which of the following are good tips for questions?

- Define terms specifically
- Use ordinal scales with middle point clear
- Answer choices should include most possibilities
- Answers don’t need to be independent
- Avoid simple sentences; make your sentences interesting
- Avoid questions that measure more than 2 things
- Avoid leading or emotional evocative language
- Use all positive wording on scaled questions
- Try to only use closed-ended questions
Ans: Survey QUESTION Tips

- Define terms specifically
- Use ordinal scales with middle point clear
- Answer choices must include all possibilities
- Answers must be mutually exclusive
- Avoid complex sentences
- Avoid questions that measure >1 thing
- Avoid leading, emotional, or evocative language
- Use all positive wording on scaled questions
- Use both open-ended and closed-ended questions