CTHCI Lab 5
Midterm Preparation

Nur Al-huda Hamdan
Media Computing Group
RWTH Aachen University
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http://hci.rwth-aachen.de/cthci
Exam Scope (1/2)

• Lectures
  • S01 Research approaches
  • S02 Experimental Research
  • S03 Research in Coding and IDEs
  • S04 Touch and Tangibles on Large Interactive Surfaces
  • S05 HCI Research in Augmented Reality

• Reading assignment (in depth)
  • (Wobbrock, 2014) 7 Research Contribution Types in HCI
  • (Griswold, n.d.) How to Read an Engineering Research Paper
  • (MacKenzie, 2007) Evaluation of Text Entry Techniques
  • (McGrath, 1995) Methodology matters
Exam Scope (2/2)

- Reading assignment (contributions, interaction design, how they prove the main contributions)
- Required reading for topics 1, 2 and 3
Question Types

• **Memory:** recall facts
  - Name, describe, explain, sketch

• **Convergent:** Integration of memorized information
  - Compare and contrast concepts
  - Analyze the given examples

• **Divergent:** Encourage free generation of ideas
  - Agree/disagree and justify your answer
  - Give an example of concepts

• **Application:** Apply knowledge/skill to a new situation
  - Extracting contribution, experimental design, criticizing validity
Terminologies

- Research approaches:
  - Empirical science, ethnography, engineering & design

- Research contributions
  - Empirical, artifact, methodological, theoretical, dataset, survey, and opinion

- Empirical research strategies
  - Descriptive, relational, experimental

- Experimental design
  - Within-subjects, between-subjects
Focus on Interaction Design, Not Technological Issues

- Describe *two* limitations in the interaction design of the *WorldKit* system. (4 points)
WorldKit
Rapid and Easy Creation of Ad-hoc Interactive Applications on Everyday Surfaces

Robert Xiao
Chris Harrison
Scott Hudson

Carnegie Mellon
Focus on Interaction Design, Not Technological Issues

- Describe two limitations in the interaction design of the WorldKit system. (4 points)
  - System only considers/works on flat surfaces
  - Widgets/UI are predefined by context.
  - Occlusion due to front projection
  - (In the paper) No object identification (kitchen example: system will not be able to detect whether the user only put onions in the onion placeholder; it will just count blobs)
Example A: Contribution and Benefits

• Key concept up to 8 points

• If the statement within 32 words, award 1 point.

• Common mistake:
  • LATPaD: The contribution is not hardware construction (in par. 3, it was referenced to previous work. (0 point)
  
  • context: touchscreen (1 point)
  • programmable friction (2 points)
  • variable friction (1.5 points)
  • friction (1 point if not mentioning "programmable")
  • targeting performance (2 points)
  • only "performance" (0.5 point)
  • enjoyment (1 point)
  • engagement (1 point)
  • sense of realism (1 point)
  • design space of friction-variable controls (2 points) (only "design space" 1 point)
  • satisfaction: not mentioned in the paper, but can be implied (0.5 point)
Example A: Experimental Design

- **Design:** Within-subjects study

- **IV:** (0.5 for name, 0.5 for levels)
  - Friction {with, without}
  - Four applications (Alarm Clock, File Manager, Game, Text Editor)

- **DV:** (1 for each scale, 0.5 for sub-scales mentioned)
  - User engagement scale
  - Tactile feedback questionnaire
  - Comparison questionnaire
  - Other DVs that are mentioned in the paper
Example B: Experimental Design

- Between-subjects study

- Rationale: the experience of blind users, which is the subject of interest, cannot be imposed on the sighted users and vice versa.

- DV:
  - gesture rating
  - stroke count
  - location
  - multi-touch or not
  - gesture nature and rationale
  - preference for text entry
Example B: Supporting Validity

- **Internal validity** is the extent to which researchers can state that only the independent variable affected the dependent variable.
  - Providing audio and visual feedback to ensure both groups got equal feedback, so lack of feedback would not affect the results
  - Limited set of commands
  - Can find more in p. 415

- **External validity** is the extent to which the results of a study can be generalized to the world.
  - Not all users had experience with touch based devices
  - User commands established from previous research
  - More in p. 415 participants section
Example B: Supporting Validity

• 5 points for internal validity, broken down as follows:
  • 1 point for a clear explanation of the causality in focus (IV -> DV)
  • 3 points for explaining a support or a threat to the causality
  • 1 point for concrete reference to the relevant parts of the paper

• 5 points for external validity, broken down as follows
  • 1 point for a clear explanation of the domain of interest for generalization
  • 3 points for explaining a support or a threat to the generalization
  • 1 point for concrete reference to relevant parts of the paper