CTHCI Lab 5 Midterm Preparation

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Exam Scope (1/2)

Lectures

- SOI 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

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- (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	Midterm 2013 M: 53%
 Memory: recall facts Name, describe, explain, sketch 	C: 12% D: 9% A: 27%
 Convergent: Integration of memorized information Compare and contrast concepts Analyze the given examples 	I: Easy: 48% 2: Moderate: 42% 3: Hard: 10%
 Divergent: Encourage free generation of ideas Agree/disagree and justify your answer Give an example of concepts 	1 1 2 1 2 1 2 1 3 2 1 2 1 2
 Application: Apply knowledge/skill to a new situation Extracting contribution, experimental design, criticizing validity 	1 2 1 3010 0110 0100 0100 0100 0100 0100

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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)



NorldKit 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 I point.
- Common mistake:
 - LATPaD: The contribution is not hardware construction (in par. 3, it was referenced to previous work. (0 point)

- context: touchscreen (I point)
- programmable friction (2 points)
- variable friction (1.5 points)
- friction (I point if not mentioning "programmable")
- targeting performance (2 points)
- only "performance" (0.5 point)
- enjoyment (I point)
- engagement (I point)
- sense of realism (I point)
- design space of friction-variable controls (2 points) (only "design space" I 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: (I 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:
 - I point for a clear explanation of the causality in focus (IV -> DV)
 - 3 points for explaining a support or a threat to the causality
 - I point for concrete reference to the relevant parts of the paper
- 5 points for external validity, broken down as follows
 - I point for a clear explanation of the domain of interest for generalization
 - 3 points for explaining a support or a threat to the generalization
 - I point for concrete reference to relevant parts of the paper