CTHCl Lab 6
Midterm Preparation
Midterm Exam Information

• Next week: **14.06.2016**
• Start at **10:15**
• Duration: **60 minutes, 60 points**
• Room: **AH IV**
Exam Scope (1/2)

• Lectures
  • S01 Research Approaches
  • S02 Experimental Research
  • S03 Understanding Statistics in HCI Research
  • S04 Interactive Textiles
  • S05 HCI Research in Augmented Reality
  • S06 Personal Fabrication

• 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, 1994) Methodology matters
Exam Scope (2/2)

• Reading assignment (contributions, interaction design, how they prove the main contributions)
  • Required reading for topics 1 and 2
Philipp Wacker: Current Topics in Media Computing and HCI (SS 16)

- NOT in the exam
- Statistical test choice beyond
  - t-test
  - paired t-test
  - ANOVA
- Calculation of statistics by hand

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**Statistics**

- **Number of IVs**
  - One
  - More than one

**Factorial ANOVA**
- Mixed-design ANOVA...

**Normality**
- Homogeneity of variance

**Homogeneity**
- Experimental design
- Number of Levels
- More than two
  - Two

**Interval data**
- ANOVA is significant

**Post hoc Tests**
- ANOVA is significant
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

**Midterm 2013**

- M: 53%
- C: 12%
- D: 9%
- A: 27%

1: Easy: 48%
2: Moderate: 42%
3: Hard: 10%
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-groups, between-groups
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
- The statement is within 30 words -> 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-groups 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)
  - User engagement scale
  - Tactile feedback questionnaire
  - Comparison questionnaire
  - Other DVs that are mentioned in the paper
Example B: Experimental Design

- Between-groups 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 (good match, easiness)
  - stroke count
  - location
  - multi-touch or not
  - gesture nature and rationale (not in excerpt)
  - preference for text entry (not in excerpt)
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