CTHCI Lab 07
Final Exam Preparation

Nur Al-huda Hamdan
Media Computing Group
RWTH Aachen University
Summer Semester 2015
http://hci.rwth-aachen.de/cthci
Exam Scope (1/2)

- Lectures
  - S01 Research Approaches in HCI
  - S02 Experimental Research
  - S06 Statistical Analysis in HCI Research
  - S07 HCI Design Patterns
  - S08 Gestural User Interfaces
  - S09 Human computation
  - S10 Personal fabrication

- Reading assignment (in depth)
  - (Wobbrock, 2014) 7 Research Contribution Types in HCI
  - (McGrath, 1995) Methodology matters
Exam Scope (2/2)

• Reading assignment
  • Understand and apply the methodology
    New! (Wobbrock et al. CHI ’2005) Maximizing the guessability of symbolic input
  • Understand and discuss implications of statistical practice in HCI
    (Cumming and Finch, American Psychologist 2005) Inference by Eye: Confidence Intervals and How to Read Pictures of Data
    Interpreting graphs
  • Contributions, interaction design, how they prove the main contributions
    (Dearden and Finlay, 2006) Pattern Languages in HCI: A Critical Review
    (Vatavu et al., ICMI 2013) Relative accuracy measures for stroke gestures
    (Bernstein et al, UIST ’10) Soylent: a word processor with a crowd inside
    (Mueller et al., 2012) Interactive Construction
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
Statistics

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

```
Number of IVs

One

Number of Levels

Two

Experimental design

Within

Normality

Yes

Homogeneity of variance

Yes

Interval data

Within

ANOVA

Yes

Post hoc Tests

ANOVA is significant
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```

```
Experimental design

Between

Normality

Yes

Homogeneity of variance

Yes

ANOVA

Yes

Post hoc Tests
```
Statistics: Knowing what’s missing & how to fix

- Chat conducted an experimental study comparing task completion time between two keyboard layouts. Chat presented the following results and conclude that users were faster with layout A than with layout B. Identify flaws in his conclusion and suggest improvements.

- What central tendency is used?
- Missing spread (CI, SD, variance)
- Missing unit
- Standardized effect size