Every baby knows the scientific method!

1. Make an observation.
2. Form a hypothesis.
3. Perform the experiment.
4. Analyze the data.
5. Report your findings.
6. Invite others to reproduce the results.

CTHCl Lab 3
Designing a User Study
User Study Protocol*

- A document that explicitly states why a research project is being conducted and how
- Purpose:
  - Clearly state the research question and hypotheses
  - Plan the research procedure in details
  - A guide for all involved personal
  - Monitor research progress

*(O'Brien and Wright, 2002) How to write a protocol
Title - “Evaluating the performance of a new keyboard layout”

Research problem - “We intend to find if our new keyboard layout performs faster and with less errors than the QWERTY keyboard. The new layout would lead to smaller form factors.”

Context - “There have been many new layouts that appear to perform faster than QWERTY but lead to fatigue [X, Y, Z]”

Aim (derived from context)

Hypotheses - “There is no difference in typing speed between the new layout and QWERTY”
Protocol Structure: The Research Method 1/2

• Independent variables & dependent variables (levels, operational definition, measurement scale and unit)

• Task - “The user will perform a composition task using statements from MacKenzie et al. (CHI 2003). The participant will do the following activities to complete the task…”

• Subjects/Participants (number, main characteristics, criteria to include or exclude them)

• Experimental design (within or between groups and how the conditions will be assigned)
Protocol Structure: The Research Method 2/2

- Experiment setup and/or apparatus (such as hardware or special features in the testing space)
- Experiment procedure (what the experimenter will do to setup the testing space)
- Data analysis methods
- References
- Include images or sketches if informative
- Write this section in future tense
In-class Exercise: Reconstruct a Protocol

- Watch paper video
- Look at the User Study section in the given paper
- Reconstruct the protocol
- Evaluate against the authors’ protocol
- How did the paper attempt to establish internal and external validity?
Understanding Finger Input Above Desktop Devices

Chat Wacharamanotham
Kashyap Todi
Marty Pye
Jan Borchers

CHI 2014
Room 718A
April 29th, 9:00 – 10:20
Protocol Evaluation Check List

- Is the research question stated clearly?
- Is there any alternative interpretation of the question?
- Suppose you can accept the stated hypotheses, does it contribute to the understanding of the research question?
- Are variables defined clearly on the operational level?
- Is there more than one possible interpretation for the variables?
- Is the experimental design chosen carefully with consideration of the trade-offs?
- Are the statistical methods specified?
- Are the resources needed to conduct the experiment stated?
- Is the duration of the experiment appropriate?
- Ultimate question: If you had no idea about the experiment before, could you pick up this protocol, set up, and conduct the experiment? (Replicability)
Reading Assignment

• Required means content from this paper is examinable

• Assignments so far
  • Last week: (MacKenzie, 2007) *Evaluation of Text Entry Techniques*
  • This week:
    • (LaToza, T. D., & Myers, B. A., ICSE 2010) *Developers ask reachability questions*
    • (McGrath, 1995) *Methodology matters*. Read before the next lab!
  • A02 will be on our public website today