Assignment 4

Mini HCI Research Experiment

Group member list due June 20, 2016, 6:00 AM
Part 1: Research questions latest on June 22, 2016, 6:00 AM
Part 2: Experiment protocol latest on June 29, 2016, 6:00 AM
Part 4: Pilot study latest appointment July 6, 2016, 15:00 PM
Presentation July 20, 2016 in the lab
Report due July 21, 2016 6:00 AM

Group of 6–7

Description

So far in the class, you have learned to read, understand, and evaluate research articles. In this assignment, you will conduct a small experiment to investigate a research question that you will come up with in the domain of Analog vs. Digital in terms of *Text and/or Images*. You will design your experiment, conduct a small-scale user study, and analyze the data from the user study. Finally, you will give a presentation of your results and write up a short research report.

In this assignment, we will focus on how experimental research methods that you have learned are applied. For your user study, you will generate a relevant research question and determine necessary metrics for collecting your information. The main challenge in this research area is gathering your data reliably both for the analog and the digital conditions. You can investigate different reading speeds, retention, experience, etc. You may use additional devices and built-in inertial sensors. You need to allocate time to work on implementing the software for such studies.

You should divide responsibility among team members. For example, form two subgroups that are responsible for implementation and user study to work in parallel.

Task

First, gather your group and send Phil a mail with the names for your team members (wacker@cs.rwth-aachen.de). Then, perform the task in each part below. Some of the parts can be done in parallel. The submission dates for part 1, 2, and 4 are the upper bound recommendation. You may submit earlier for an earlier feedback and have more time for the later parts.

Part 1: Research question generation: You are to propose three experimental research questions that you want to investigate. (Your question does not need to be original or novel.) Phil will choose one of the proposed research questions and help you refine it for the study. (Turnaround time: 1–2 working days)

For inspiration, have a look at this note from CHI 16. Use this as a starting point to find: related work, interesting independent variables, important dependent variables, valid tasks, and variations of experimental design and procedures.

> Geoff Kaufman and Mary Flanagan. 2016. High-Low Split: Divergent Cognitive Construal Levels Triggered by Digital and Non-digital Platforms. In *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems* (CHI '16). ACM, New York, NY, USA, 2773-2777. DOI=http://dx.doi.org/10.1145/2858036.2858550

❏ Submit a text file listing three research questions that you want to investigate. You may add a short motivation for each.

Part 2: Experiment protocol and consent form: After the research question has been approved, create an experiment protocol (as you did in Assignment 2, but this time you must include Data Analysis section as well). You must include at least three citations in the Context section of your protocol.

You also need to provide a signed consent for the users who will participate in your study. Use the provided template (https://docs.google.com/document/d/1NQK3Lm_Gc0kd8OPC3z6ZCsBQrslNJHPT1cLJzglcSgQ/edit?usp=sharing) to create the consent form.

Your experimental protocol will be reviewed by two peer groups (to be assigned after all groups have their research question approved) and by Phil (Turnaround time: 3–4 working days).

❏ Share a copy of a Google Doc containing your experiment protocol and the consent form (give a "can comment" permission).
❏ Peer group: provide feedback to the experiment protocol (Turnaround time: 3–4 working days)

Part 3: Implementation (depending on research question): You may work on the implementation as soon as the research question is approved. You may need to make adjustments according to the changes and feedback to the user study protocol. Note that you need to explicitly take care of these functionalities on top of your implementation:

- *Ordering and configuration of the condition that the users will be exposed.*
- *Data logging:* Make sure that your log provides the adequate information you need in order to measure the dependent variables you planned.

Part 4: Pilot study: Once you have the implementation, experiment protocol, and the consent form ready, test the entire procedure of your experiment with one or two of your group members. Then, schedule your pilot study with Phil and one person from each of your peer group (so 3 people apart from your group). We will observe and comment on your experiment on the following points:

- How you prepare the setup before the study
- How you conduct the study
- How were and what are the data logged both in the software and manually

❏ Test run your study with your team members

❏ Make an appointment with Phil and one person from each of your peer group to observe your pilot study

❏ At least 24 hours before the pilot study, send Phil and the peer observers the experimental protocol (PDF, by email).

Part 5: User study: After the pilot study, you will conduct the user study with at least five participants. You may recruit classmates from other groups or external people, depending on your research question.

- Don't forget to collect demographic information, e.g., age, gender, etc.
- Organize the data you collected into folders and create a README file.
- Separate the data from the identifiable information of your participants. E.g., refer to participants in the data by anonymous ID.

Part 6: Data analysis: You will analyze your data as planned in the experimental protocol. For the purpose of this class, you may use solely the central tendency (mean or median) and spread (95% confidence interval or interquatile range) for the analysis. Null-hypothesis significant tests (e..g, ANOVA or *t*-tests) are optional.

• Keep track of your data analysis as you will have to submit the analysis details

Part 7: Presentation and write up: Here, you will prepare a 10-minute presentation and write a report for your project (2–3 pages). The presentation must provide an overview of the research questions, the procedure, and the main results. As for the report, use the CHI Proceedings Format Latex or Microsoft Word template (http://chi2017.acm.org/submission-formats.html) and structure your paper similar to the conference papers:

- *Introduction:* describe the context that you are investigating and motivate the readers of the importance of your research questions
- *Related work:* review previous research that are relevant to your research question to highlight the gap of the knowledge.
- *User study:* Briefly describe procedure, participants, and results from your user study
- *Discussion:* Discuss the implications of your results and connect back to the research question and the context

You may add more sections as appropriate.

❏ Prepare the presentation for your project

❏ Submit a PDF file for the final report

❏ Submit a PDF file for the final version of the experiment protocol and the consent form

❏ Submit the anonymized raw data

❏ Submit the analysis file (e.g., Excel spreadsheet, JMP data files)

Submission
Submit each part above by email to wacker@cs.rwth-aachen.de with the subject "[CTHCI] A04 Group XX".