

## Assignment 6: Usable Privacy

**Your data from Parts 1 & 2** of this assignment are due on the shared [Google Sheet](#) on Tuesday **December 7, 2021 at 11:59 pm**. Part 3 and the final submission are due on **December 10, 2021 at 5 pm**. You may work with a partner on this assignment and submit one project per team. You may NOT work with the same partner you have worked with on a previous assignment. Submit your solutions electronically via Moodle.

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### Background

Modern operating systems and software applications designed for consumer use often have a range of customization options including extensive privacy settings. These settings ostensibly allow users to tune their preferred tradeoff between privacy and functionality, such as by turning off voice assistants or browsing in “incognito mode.”

However, the complexity of customization options and the sheer number of possible settings can discourage users without sufficient time or technological expertise from effecting privacy behaviors that match their real preferences. Additionally, the range of user interfaces across devices and platforms challenges even experts who wish to alter default privacy options.

The field of usable privacy studies how users interact with and understand privacy features of computer technologies. In this assignment, you will conduct a small usable privacy experiment to measure the difficulty of adjusting privacy settings on different platforms. You will contribute your data to a shared class dataset and generate summary figures of the type that could be included in an academic publication.

### Objectives

- Measure the user-friendliness of two common privacy settings in terms of interaction counts and time to adjust. Contribute the data from your measurements to a shared dataset.
- Generate publication-style figures from the shared data and answer open-ended questions about the results of the experiment.

### Provided Files

- [Readme.pdf](#): This file.
- [Questions.txt](#): File for you to complete with written responses to open-ended questions.

## Part 1. Counting Interactions (20%)

A frequently-used metric of user-friendliness is the number of “interactions” it takes to access and adjust a customization setting. Interactions can be clicks, swipes, taps, text entries, fingerprint scans, etc., but all must be counted. Your first task is to count the number of interactions it takes to perform the following privacy customization activities starting from the home screen of a smartphone or the starting page of a browser.

- Turn off GPS location services on a smartphone
- Turn off third-party cookies on a web browser and clear existing cookies

Report your data in the Part 1 tab of the shared [Google Sheet](#).

## Part 2. Timing (20%)

Another metric for user-friendliness is the average time it takes for a user to adjust a privacy setting. In this part of the assignment, you will conduct an experiment to compare the amount of time it takes “expert” versus “typical” users to adjust the same privacy settings from Part 1.

First, find a volunteer who you consider an “expert” user. This may be a friend or family member (a good choice would be another computer science major), but it must not be someone else in this class. You should tell them that you are doing a class project and that you would like them to perform the customization actions from Part 1 while you observe. Time how long it takes the volunteer to adjust each of the settings, starting from the home screen of their smart phone or the starting page of their browser. You may give them hints on how to proceed if they get stuck, but encourage them to figure out the process on their own. Report the times (in seconds) and other information about your experiment in the Part 2 tab of the shared [Google Sheet](#).

Next, repeat this process with a different volunteer who you consider a “typical” user. This volunteer can be a friend or family member, but it must not be anyone in this class nor another computer science major. Again, report the times (in seconds) and other information about your experiment in the Part 2 tab of the shared [Google Sheet](#).

**All of your data from Parts 1 & 2 must be uploaded to the shared Google Sheet by 11:59 pm on December 7.**

## Part 3. Results Analysis (60%)

Once a researcher has collected data from a user study, the next step is to plot the results in a way that highlights important takeaways and is easily interpretable to an outside reader.

Your task is to download the data from the shared Google Sheet on or after December 8 and create two figures visualizing the results. The first figure should display and compare the number of interactions required to change the privacy settings, grouped by type of smartphone/browser (Part 1 data). Your second figure should compare the time it takes “expert” vs “typical” users to perform the settings changes, grouped appropriately (Part 2 data).

You have a great deal of latitude in how you present these data. Your submitted figures will be graded on their accuracy, clarity, and emphasis of important takeaways from the results. There are many examples of good (and not so good) figures online which you can use for inspiration. Don’t forget general principles of effective graphs, including proper labels, sufficiently large font sizes, minimizing distractions and “busyness”, etc.

You are welcome to reuse plotting code you wrote for Assignment 4 with appropriate tweaks for this user study data.

Finally, complete the open-ended questions in [Questions.txt](#), which include providing captions for both figures. These captions should enable the figures to be self-contained, providing a basic summary of the data included in the figure and the most important takeaway the figure is trying to communicate. The captions must also be  $\leq 3$  sentences.

## Deliverables

Upload the following files to Moodle:

- [Part1Figure.png|jpg|pdf](#)
- [Part2Figure.png|jpg|pdf](#)
- [Questions.txt](#) with your responses to open-ended questions

## Extra Credit “Bug Bounty”

If you find a bug anywhere in this assignment, please inform Prof. Apthorpe. The first student (or partners) to find any particular bug will be given a small amount of extra credit. This is an incentive to start the assignment early and will help make the course better for students in future years.