Tangible Two-Factor Authentication

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Project Outline

Building on previous research, this project hopes to assess the usability of physical objects as methods of authentication. It has been previously proven that many people choose not to use 2-factor authentication due to its perceived cumbersomeness, and that bring the idea of security out of the digital and into the physical makes people take it more seriously, hence this project hopes to prove that tangible objects as two factor authentication methods are valid, and helps people to care more about their security.

By using past surveys and the previously designed atomic interaction space, models will be created according to what people desire as well as how they will be used for authentication, then assessed in a user study over a longer period of time than that of the 3D-Auth paper which this project builds on. To facilitate this study, an app will be provided to assess each authentication attempt as well as collect other information that may be useful to investigate.

Progress

- The survey has been analysed, with the most desired shapes and sizes available for use in creating models
- Related works have been investigated, with many relevant works being assessed
- Models have gone through multiple design stages, with 8 total being designed, and 5 being modelled so far with at 2 more in progress
- Familiarity with the 3D printer has been obtained, as well as ensuring that the printer is working properly (problem with the IR sensor has been dealt with and prints are being made correctly)
- Version control for the projects has been created, encapsulating models, notes, and other related code
- IDE chosen for creating the Android app (Android Studio) and some test apps have been made to become familiar with environment.
- App is currently in progress of being built, as of this moment the issue of notifications is being looked into so we can remind participants to ‘log in’
- Some test models have been printed

Problems and Risks

Problems

- So far, implementing notifications on android is a bigger problem than expected, due to more recent versions not allowing background processes to run, I’m currently in the process of finding a way to schedule notifications
- Printing of the models is time consuming, which may cause issue depending on how many models will be needed for the study (this is more of a potential problem).

Risks

- The interaction space available also includes some more cumbersome designs, such as augmentation. Mitigation: Only a selection of the final models will be studied, excluding those that have for example multiple separate models perhaps.

- The models have not been tested for extended periods of use, so they may stop working through the course of the study, as well, they may break through daily use. Mitigation: Research was done into minimum thicknesses for objects, however past this, I'm not sure there's much that can be done
- In the case that the app does not get completed in time, this would disrupt the user study which hopes to run late January. Mitigation: All being well, this shouldn't come to pass, but if it does, the user study will need to be moved later, likely in February and run for 1 week instead of the planned 2

Plan

Pre-Semester 2

- Design all related documents for the user study to run in late January, this includes the pan for the meeting, initial and exit surveys, consent form, design of exit interview. Once back in semester 2 I'll set up a meeting to make sure everything is there.
    - Deliverables include all of these documents, will likely be sent early semester 2
- Further work on the app, hopefully figure out how to schedule notifications, design the UI and collection of data on authentications. For this as well, I'll be exploring the app that I was sent by Morgan

Semester 2 – Pre-study

- Complete any outstanding work on the app, preferably in the first week or so
- Send out requests for participants though slack, email lists, etc and organize when the meetings should take place

Semester 2 – During study

- Perform all of the initial meetings and be available to answer any questions through the course of the study.
    - Deliverables will include the questionnaires, minutes from either both meetings or just the exit interview, data collected from the app.

Semester 2 – Post-Study

- As soon as the study ends, work will be done on the data collected, analysing UX, robustness of models, etc
    - Deliverables will include the processed data and other analysis
- Work will begin proper on the dissertation
    - A first draft will be submitted at least 2 weeks before deadline