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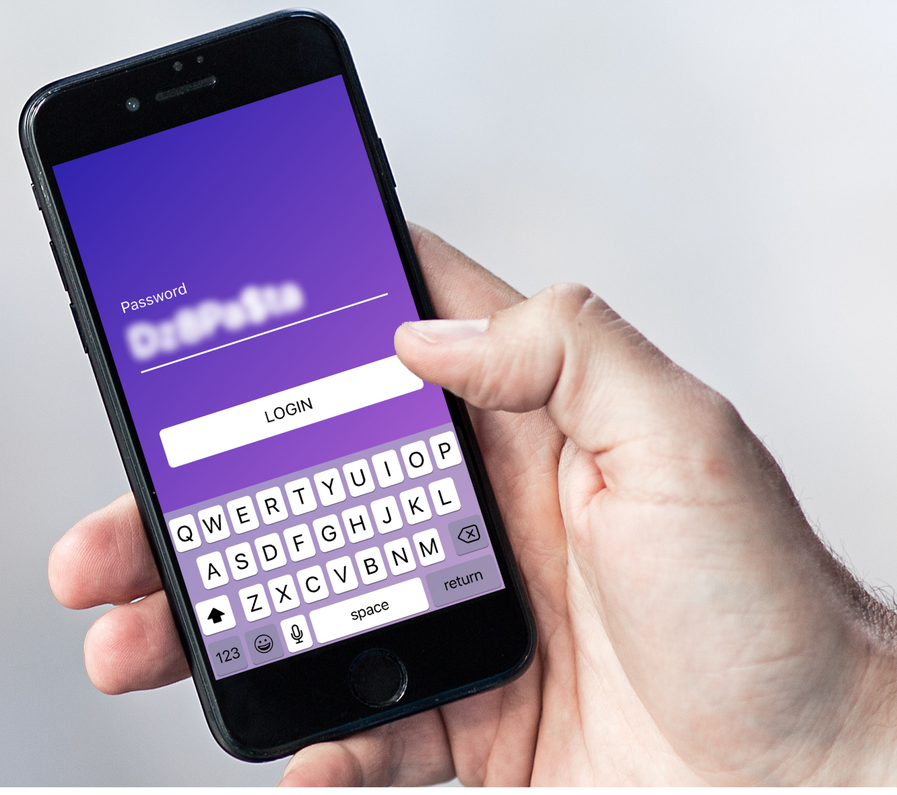
PASSWORD BLUR

A user-friendly approach for secure password input.

When users type passwords, they are usually shown in the form of asterisk signs instead of the password's characters to prevent shoulder surfing. On the other hand, because typing on mobile devices is error prone, systems usually show the user the typed character for a few milliseconds before turning it to an asterisk. The aim of this project is to investigate how the use of filters/effects on the written password can influence the trade off between usability and security.



1. Quantitative User Study

Design (Online Survey)

The selection of filters based on related work, where the same approach was evaluated for image distortion. We selected 4 filters based on previous work that used filters to distort images to protect privacy.

- 4 filters (Color-Halftone, Crystallize, Gauss and Mosaik) were tested with 2 gradations each
- 3 types of usability-related and 3 types of security-related questions for each filter
- a pool of 48 unique questions
- every participant was presented 20 random questions from the pool of 48

EXAMPLE FOR SECURITY-RELATED QUESTIONS:

Welche zufällige Zeichenfolge wird hier gesucht?
Geben Sie möglichst viele Zeichen an.

EXAMPLE FOR USABILITY-RELATED QUESTIONS:

Welche Antwortoption entspricht dem Wort "Gangschaltung"?

A)

B)

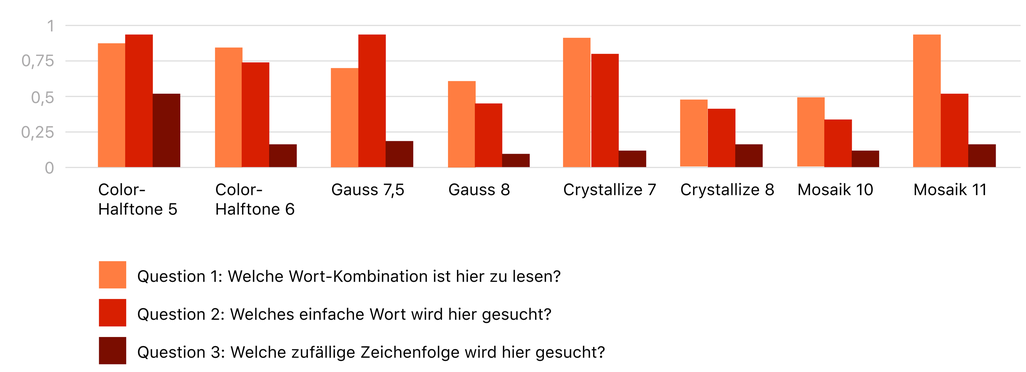
C)

D) Keine Aussage möglich

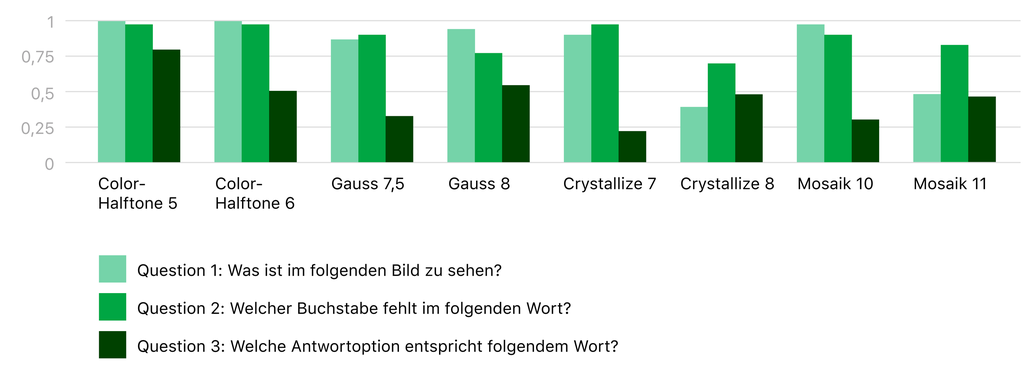
Results

- 163 participants
- on average each question was presented more than 67 times

AVERAGE SUCCESS RATE OF SECURITY-RELATED QUESTIONS



AVERAGE SUCCESS RATE OF USABILITY-RELATED QUESTIONS



2. Qualitative User-Study (ongoing)

Design (Lab Testing)

Based on the outcomes of the quantitative study shown above we will select one filter for a qualitative usability study.

- Task 1: User types password with classic input and text distortion, error-rate and speed is measured
- Task 2: User has to correct mistakes in an already pre-filled password input form, speed is measured
- Task 3: User watches videos of shoulder-surfers and tries to guess the input, success-rate

3. Next Steps and Future Work

Depending on the result of the qualitative user study, a long-term field-study could be conducted among a larger number of people to get even sharper insights on the differences between the filters' gradiations and the overall performance.