The Realities of Graphical Passwords

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The Problem

Graphical passwords are a genre of knowledge-based authentication that can offer improved usability and security over alphanumeric passwords on mobile devices, infrequently used systems or as an extra layer of knowledge-based authentication. Research in the field to date has focused on exploring the design space of graphical passwords, leaving issues of real world use either poorly considered or avoided. Issues such as **shoulder surfing**, the effect of multi-password **interference**, the ability of users to **verbally share secrets** and methods to combat the **predictability of user choice.**

Description

"Interesting performance differences were noted between male and female performance"

One implicit design feature of some graphical systems is that images can be difficult to write down or *describe* to others.

In a study of the Passfaces system (see image) we explored the extent to which users could describe faces to another user, also the extent to which another user could use these descriptions to login to a system. To make this task more difficult we experimented with measures to make this task more difficult by grouping the faces by being *visually similar and descriptively similar*.

Success rates of *imposter* logins were surprisingly low (9%). Interesting performance differences were noted between male and female performance.

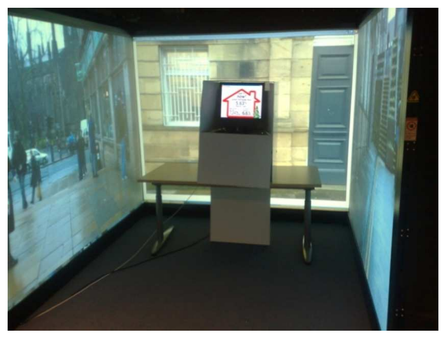
P. Dunphy, J. Nicholson, and P. Olivier. Securing Passfaces for Description. In SOUPS '08: Proceedings of the 3rd symposium on Usable privacy and security, New York, NY, USA, 2008. ACM.

Shoulder Surfing

"Three 9ft x 7ft screens were used to immerse the participant in a familiar environment while using our ATM"

Shoulder surfing is a phenomenon where attackers use simple observation techniques to steal sensitive information. We carried out a study using a Tobii x50 eye tracker as input to the Passfaces system in an ATM scenario. Our goal was to explore user performance and acceptance of such a setup. To entice natural behaviour we enhanced the realism of the scenario by:

i. Crafting a cashpoint-like casing to give the computer a realistic shape.
ii. Using three 9ft x 7ft screens wrapped around the participant to immerse them in a familiar environment.



User Choice

I have acquired exhibit space at the Royal Society Summer science exhibition in London (30th June – 3rd July). Here I will be gathering user choice data on my Background Draw a Secret (BDAS) system.

Selected for the Royal Society's SUMMER SCIENCE EXHIBITION 08

Future Work

Future efforts will focus towards:

i. Developing sound **user study methodology** to advance knowledge gained already, as well as make realistic conclusions on multi-password interference.
ii. Develop systems that are **exemplars** of the desired behaviour in these categories.
iii. Use a realistic controlled user study as a tool to make empirical investigations of **user experience**: what parameters make people feel secure and win trust?

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