Pass-Pic: A Mobile User Authentication

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Abstract—**Conventional authentication methods utilizing alphanumeric username and passwords, PIN numbers, or any combination thereof have many weaknesses. On modern smart phones there are multiple ways users can authenticate. The traditional username password combination is used often as well as PIN passwords and pattern based passwords. The problem with these methods is that they are still vulnerable. A short password or to a much greater extent a PIN, or a pattern password can be defeated by various techniques such as smudge attacks, key loggers and so on. Our aim with Pass-Pic is to implement a picture based authentication system that is both more secure and easier for the user to both input and remember.**

Keywords—mobile authentication; passwords; security

I. INTRODUCTION

Our dependence on smart devices is inevitable in the digital era. Most Android and other smartphone consumers use a touch-screen QWERTY keyboard. While the keyboards on smartphones tend to work well and be the best option for text input, they are prone to keystroke errors. In a world where using multiple complex passwords is the ideal to maintaining personal security, entering passwords on a touch screen keyboard can be both frustrating and time consuming. Some application developers seem to have resolved this problem by creating an application that stores the users passwords. The question that arises, however, is what is the best way to secure these password storage apps, that is both user-friendly and not time consuming?
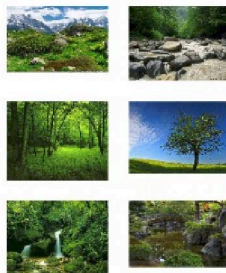

Fig. 1. Passpic login screen

II. PROTOTYPE

We created a proof of concept, Pass-Pic, to bring a picture based authentication method to modern smartphones. The schema follows three steps; Registration phase, database construction and lockout recovery phase. Pass-Pic works by displaying to the user a set of six real photos onto the screen at one time.The user must then pick the correct sequence of 'n' images. The catch here is that each screen of the six images is displayed for only a few seconds and the correct image might not be on the current screen, causing the user to wait. The pictures show up in a different position each time [1]. This increases authentication security by making it harder for anyone to guess your password sequence. If the user entered their password incorrectly twice in a row, there was a lockout until the user answered their security question. Pass-Pic is not vulnerable to smudge attacks and also, does not create any kind of vibration when the screen is touched, which protects it from vibration based key loggers [2]. Using pictures has been shown to have a much higher recall rate than text passwords or PIN numbers [3]. These results were also duplicated in our case study as shown in Table I.

III. CONCLUSION

Pass-Pic has the advantage over other generic passwords in terms of recall rate, failure to login rate, and security, and could become a viable option in practice. Each user that attempted to enter the password, did so with ease and without making mistakes. The recall rate was impressive even after one week. This makes it less likely for the user to inadvertently give away their password by writing it down or telling it to someone because it is easier for them to remember.

TABLE I.   RECALL SUCCESS RATE (AFTER 1 WEEK WITH NO ACCESS TO PASS-PIC)

User 1	User 2	User 3	User 4
100%	75%	100%	90%

IV. ACKNOWLEDGMENTS

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