TOWARDS AN EFFECTIVE RECOGNITION GRAPHICAL PASSWORD MECHANISM BASED ON CULTURAL FAMILIARITY

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Abstrak

Kata laluan berasaskan teks untuk pengesahan adalah terdedah kepada serangan kamus kerana pengguna cenderung untuk mencipta kata laluan yang lemah supaya mudah diingat. Apabila berurusan dengan pengesahan pengguna, gambar adalah lebih mudah diingati berbanding dengan perkataan. Oleh itu, kajian ini bertujuan menentukan jenis gambar yang mungkin dipilih berdasarkan latar belakang kebudayaan pengguna. Ia juga mengkaji hubungan antara pilihan kata laluan dan kebiasaan budaya serta juga kesan Kata Laluan Grafik (GP) terhadap keselamatan dan kebolehgunaan. Senarai garis panduan telah dicadangkan bagi pengiktirafan kata laluan grafik. Ia dipercayai boleh meningkatkan keselamatan dan juga kebolehgunaa Seramai 40 orang pelajar telah mengambil bahagian untuk membina pangkalan data GP. Kemudian, penilaian telah dijalankan untuk mengkaji kebiasaan dan keupayaan pengguna mengenali gambar dari pangkalan data dengan menggunakan 30 responden yang lain. Kadar login yang Berjaya adalah 79.51% dan ini menunjukkan bahawa GP berdasarkan kebudayaan telah meningkatkan kebiasaan responden dengan menggalakkan daya ingatan mereka. Responden yang memilih GP biasa mempunyai kadar cubaan meneka yang lebih tinggi berbanding responden yang memilih gambar yang tidak biasa. Kesimpulannya, sebanyak 8 garis panduan telah di bentuk berdasarkan aspek pilihan pengguna untuk memilihi dan memproses GP. Garis panduan ini boleh digunakan oleh pereka sistem GP untuk membangunkan sistem GP yang berkesan..

Kata kunci : Pengesahan sistem, Kata laluan grafik, Serangan keselamatan, Kebolehgunaan, Latar belakang kebudayaan

Abstract

Text-based passwords for authentication are exposed to the dictionary attack as users tend to create weak passwords for easy memorability. When dealing with user's authentication, pictures are more likely to be simply remembered in comparison with words. Hence, this study aimed to determine the types of pictures in accordance to users' cultural background. It also investigated the relationship between the choices of password and the cultural familiarity along with the effect of Graphical Password (GP) on security and usability. A list of guidelines was proposed for the recognition of graphical passwords. This is believed to increase the security as well as usability. A total of 40 students were recruited to build a GP database. Further, an evaluation was conducted to investigate users' familiarity and recognition of the GP from the database using 30 other respondents. The results showed that the 30 participants positively responded to the familiar pictures in accordance to their cultures. The result of successful login rate was 79.51% which indicates that cultural-based GP has increased the respondents' familiarity by promoting their memorability. Further, the respondents who chose familiar GP had higher guessing attack rate than the unfamiliar GP. Finally, a total of 8 guidelines were established based on the aspects that correspond to the users' preferences for choosing and processing GP. These guidelines can be used by graphical password system designers to develop effective GP systems.

Keywords: System authentication, Graphical password, Security attack, Usability, Cultural background

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Table of Contents

List of Tables

List of Figure

List of Abbreviations

DAS	Draw A Secret
GP	Graphical Password
GPG	Graphical Password Guideline
GSR	Guessing Success Rate
RBGP	Recognition Based Graphical Password
SR	Successful login Rate
TL	Time Login

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The latest advances in networked computing bring a number of advantages to the security of applications along with possible chances for becoming a target to numerous online threats. As such, the application of computer security, which is viewed as complex paradigm, is now the main area for researchers to secure and enhance its current security mechanisms for the benefit of organizations and individuals (Colella & Colombini, 2012; Vacca, 2013). This include the constant upgrades to the security services which lay behind the need for protecting end-users against theft or damage of one's electronic resources. Even with today's security parameters, it become difficult for users to attain these updates (Cavalcante et al., 2012), which, in turn, led to raising the needs for adequate and simple security features that users can easily memorize and keep.

However, the actual ubiquity regarding graphical interfaces for applications, and input devices such as touch-screen devices that permit in addition to typed input, has opened the doors for developing various graphic user authentication approaches (e. g., (Bellare, Ristenpart, & Tessaro, 2012; Khanh Dang & Tri Dang, 2013; Mihajlov & Jerman-Blažič, 2011; Salim, Reid, & Dawson, 2015)). Graphical authentication approaches were initially introduced to suit devices which do not allow typewritten input. Furthermore, current graphical authentication approaches present the possibility for offering a kind of authentication which is closely more robust than text passwords (Renaud, Mayer, Volkamer, & Maguire, 2013). These efforts were based

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