

A Survey on Textual Graphical Password Scheme

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Abstract

Information and computer security has large numbers of combinations of passwords for the authentication process, but in which alphanumeric username and passwords has too much drawbacks. To reduce all this vulnerabilities of traditional methods, textual graphical password scheme using color combinations have been developed for the possible alternative solution to old one traditional system. The textual password authentication is not secure and has high failure rate compare to the others because shoulder surfing is too much easy for textual based password. To overcome these, the primary design without any extra complexity into the authentication process is improved. With this textual graphical scheme using color, user can efficiently and securely login to the system without worrying of shoulder surfing attack.

Keywords: Authentication, Vulnerabilities, Graphical password, Shoulder surfing attack.

1. Introduction

Authentication is a process which gives permission to one entity for establishing the identity of another entity. Authentication assures guarantee of information security. The convenient method is password authentication. Alphanumeric passwords are more familiar and easy for the users which emphasis on strings of letters and digits. These alphanumeric passwords have some security issues. Due to the limitation of human memory, most users like to choose short or simple passwords which are easy to remember. Most of the time users set the password as personal names of family members, birth date, or other dictionary words. These passwords can be easily guessed by the attacker. Now day's users choose same password for many applications like passwords for social

networking, personal computers, E-mail, and more to reduce memory burden. This may reduce security. Alphanumeric passwords are vulnerable to shoulder surfing attack.

The shoulder surfing attack is an attack in which unauthorized person can get user's password by watching over his shoulder when he enters his password. Then the graphical authentication system is introduced which is not much secure and not that much efficient. This problem can be solved by using color combinations for the textual graphical password authentication system.

2. Related Work

In 2002 Sobrado proposed three shoulder surfing resistant schemes, triangle scheme, movable frame, and intersection scheme.

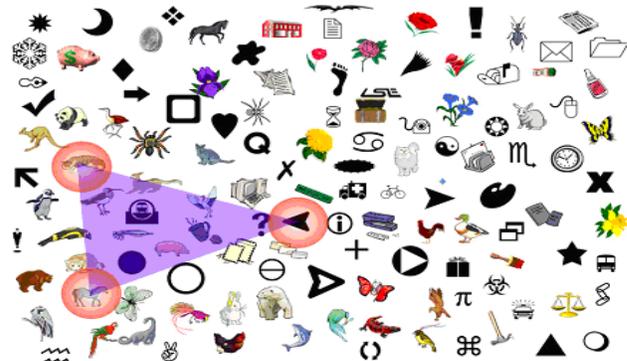


Fig.1 Triangle Scheme

In triangle scheme as shown in fig.1 the system will randomly spread the N number of object and user has to select the pass object as his password which is selected previously to login into the system. User must select the pass object and as to click inside the invisible triangle created by those objects.

The same concept is used in movable frame. Only the difference is one object out of the pass object is placed on frame. The pass objects are placed randomly within the frame as shown in fig. 2. User will move the frame until the object on the frame lines up with the remaining both.



Fig.2 Movable frame

In intersection method this concept has made more complex. It uses two invisible lines and increased the number of pass object as shown in fig. 3. User has to click near the intersection of two invisible lines, inside the convex quadrilateral formed by those objects.

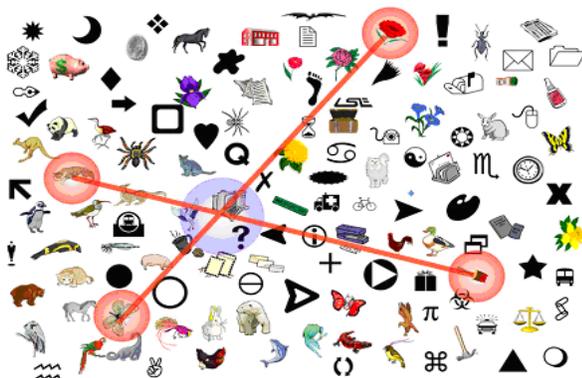


Fig.3 Intersection scheme

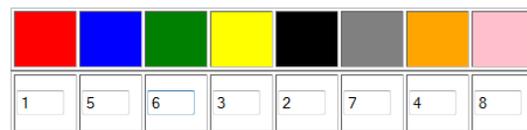
Both the interaction and movable frame have high failure rate. In triangle scheme user has to memorize the pass objects and choose those objects. So the memory burden of the user is high [1].

T. Yamamoto proposed a shoulder-surfing-resistant image-based authentication system with temporal indirect image selection scheme in July 2002 which consist TI-IBA. Although image-based user authentication systems

have gotten a lot of attention recently to reduce the burden of memorizing passwords, they can be vulnerable to shoulder-surfing attacks. To overcome this problem, shoulder-surfing-resistant image-based authentications with indirect image selection (indirect image-based authentication, or I-IBA) have been proposed. However, because they spatially arrange image-sets over a wide space, two problems with these schemes are that they require a large screen and that it is difficult for authorized users to find and select their pass-images in the wide area. Therefore, by temporally arranging the image-sets, we implemented another indirect image-based authentication scheme (temporal I-IBA, or TI-IBA) that is not constrained by the screen size and makes it easy for authorized users to recognize their pass-images. In TI-IBA icons are displayed temporally. It requires small screen size and easy to find the pass icons for user. The possibility of accidental login is high [2].

After that, the colorlogin is implemented in an interesting game way to weaken the boring feelings of the authentication. Colorlogin uses background color, a method not previously considered, to decrease login time greatly. Multiple colors are used to confuse the peepers, while not burdening the legitimate users. Meanwhile, the scheme is resistant to shoulder surfing and intersection attack to a certain extent. So in Dec 2009, H. Gao proposed graphical password scheme using color login. In this color login uses background color which decrease login time. Possibility of accidental login is high and password is too short [3].

The above system is improved by combining text with images or colors to generate session passwords for authentication. Session passwords can be used only once and every time a new password is generated. In May 2011, M. Sreelatha proposed Hybrid Textual Authentication Scheme. This scheme uses colors and user has to rate the colors in registration phase as shown in fig. 4.



submit

Fig.4 Rating of color in registration phase

During login phase four pairs of colors and 8*8 matrix will be displayed as shown in fig. 5. As the color rating given by the user, the password will generate. First color shows row number and second shows column number of

the grid. Intersecting element is the first letter of the password. The user has to memorize the rating and order of the colors. So it becomes very hectic to user [4].

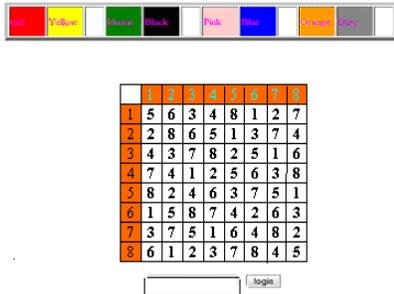


Fig.5 Login Interface

Novel Shoulder-Surfing Resistant Authentication Schemes using Text-Graphical Passwords system is proposed by M.K.Rao in 2012. In PPC some rules are defined and those are followed by the user to get the session password. But this scheme is very complicated and hectic [5].

Then, Yi-Lun Chen proposed a simple text based shoulder surfing resistant graphical password scheme in 2013. The text based shoulder surfing resistant graphical password scheme is improved by using color. In the registration phase, user has to choose one color and set his textual password.

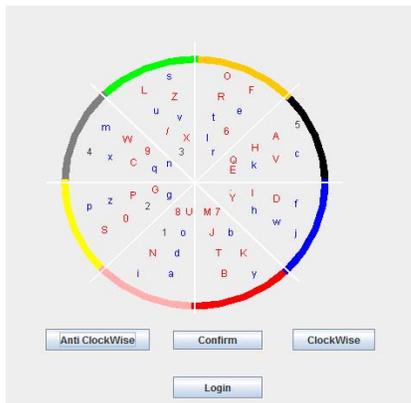


Fig.6: An example of the login screen.

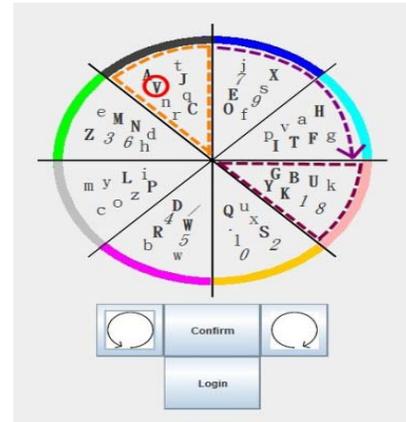


Fig. 7: An example of rotating the sector.

In login phase, system displays circle which is divided into 8 sectors and each sector has different colors as shown in fig 6. All the characters are placed randomly in these sectors. User has to rotate the sector as shown in fig. 7 till all characters come into previously chosen color. But characters are not clearly noticeable and hacker can guess the color [6].

3. Conclusions

It is concluded that alphanumeric and graphical password schemes have some limitations. The problem of small size of passwords and more security can be solved by using simple text-based shoulder surfing resistant graphical password scheme. In this scheme user can easily and efficiently login to system. The operation of the simple textual graphical scheme using color is simple and easy to learn for users. The user can easily and efficiently to login the system without using any physical keyboard or on-screen keyboard. It provides more security against shoulder surfing attack.

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