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Captcha and Graphical Password Schema in Online Guessing Attacks, relay attacks if combined with dual view technologiDDes

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ABSTACT

An AI problem for security is emerging as an exciting new paradigm, but has been underexplored. In this paper, we introduce a new security primitive based on hard AI problems, namely, a novel family of graphical password systems integrating Captcha technology, which we call CaRP (Captcha as gRaphical Passwords). CaRP is click-based graphical passwords, where a sequence of clicks on an image is used to derive a password. Unlike other click-based graphical passwords, images used in CaRP are Captcha challenges, and a new CaRP image is generated for every login attempt. The notion of CaRP is simple but generic. CaRP can have multiple instantiations. In theory, any Captcha scheme relying on multiple-object classification can be converted to a CaRP scheme. We present exemplary CaRPs built on both text Captcha and image-recognition Captcha. One of them is a text CaRP wherein a is password a sequence of characters like a text password, but entered by clicking the right character sequence on CaRP images. We present a new security primitive based on hard AI problems, namely, a novel family of graphical password systems built on top of Captcha technology, which we call Captcha as graphical passwords (CaRP). CaRP is both a Captcha and a graphical password scheme. CaRP addresses a number of security problems altogether, such as online guessing attacks, relay attacks, and, if combined with dual-view technologiDDes, shoulder-surfing attacks. Notably, a CaRP password can be found only probabilistically by automatic online guessing attacks even if the password is in the search set.

Keywords: CaRP,technologiDDes,AI,Captcha,Cryptosystem,Hellman key exchange,Digital Signature Algorithm

INTRODUCTIONb

A fundamental task in security is to create cryptographic primitives based on hard mathematical problems that are computationally intractable. For example, the problem of integer factorization is fundamental to the RSA public-key cryptosystem and the Rabin encryption. The discrete logarithm problem is fundamental to the ElGamal encryption, the Diffie- Hellman key exchange, the Digital Signature Algorithm, the

elliptic curve cryptography and so on. Using hard AI (Artificial Intelligence) problems for security, initially proposed in [17], is an exciting new paradigm. Under this paradigm, the most notable primitive invented is Captcha, which distinguishes human users from computers by presenting a challenge, i.e., a puzzle, beyond the capability of computers but easy for humans. Captcha isnow a standard Internet security technique to protect online email and other services from being abused by bots. However, this new paradigm has achieved just a limited success as compared with the cryptographic primitives based on hard math problems and their wide applications. Is it possible to create any new security primitive based on hard AI problems? This is a challenging and interesting open problem. In this paper, we introduce a new security primitive based on hard AI problems, namely, a novel family of graphical password systems integrating Captcha technology, which we call *CaRP (Captcha as gRaphical Passwords)*. CaRP is click-based graphical passwords, where a sequence of clicks on an image is used to derive a password. Unlike other click-based graphical passwords, images used in CaRP are Captcha challenges, and a new CaRP image is generated for every login attempt. The notion of CaRP is simple but generic. CaRP can have multiple instantiations. In theory, any Captcha scheme relying on multiple-object classification can be converted to a CaRP scheme. We present exemplary CaRPs built on both text Captcha and image-recognition Captcha. One of them is a text CaRP wherein a password is a sequence of characters like a text password, but entered by clicking the right character sequence on CaRP images.

CaRP offers protection against online dictionary attacks on passwords, which have been for long time a major security threat for various online services. This threat is widespread and considered as a top cyber security risk [13]. Defense against online dictionary attacks is a more subtle problem than it might appear. Intuitive countermeasures such as throttling logon attempts do not work well for two reasons:

1) It causes denial-of-service attacks (which were exploited to lock highest bidders out in final minutes of eBay auctions [12]) and incurs expensive helpdesk costs for account reactivation.

2) It is vulnerable to global password attacks [14] whereby adversaries intend to break into any account rather than a specific one, and thus try each password candidate on multiple accounts and ensure that the number of trials on each account is below the threshold to avoid triggering account lockout.

CaRP also offers protection against relay attacks, an increasing threat to bypass Captchas protection, wherein Captcha challenges are relayed to humans to solve. Koobface was a relay attack to bypass Facebook's Captcha in creating new accounts. CaRP is robust to shoulder-surfing attacks if combined with dual-view technologies.

i. Graphical Password
ii. Captica in Authentication
iii. Thwart Guessing Attacks

iv. Security Of Underlying Captcha

Graphical Password :

In this module, Users are having authentication and security to access the detail which is presented in the Image system. Before accessing or searching the details user should have the account in that otherwise they should register first.

Captica in Authentication:

It was introduced in to use both Captcha and password in a user authentication protocol, which we call *Captcha-based Password Authentication (CbPA) protocol*, to counter online dictionary attacks. The CbPA-protocol in requires solving a Captcha challenge after inputting a valid pair of user ID and password unless a valid browser cookie is received. For an invalid pair of user ID and password, the user has a certain probability to solve a Captcha challenge before being denied access.

Thwart Guessing Attacks :

In a guessing attack, a password guess tested in an unsuccessful trial is determined wrong and excluded from subsequent trials. The number of undetermined password guesses decreases with more trials, leading to a better chance of finding the password. To counter guessing attacks, traditional approaches in designing graphical passwords aim at increasing the effective password space to make passwords harder to guess and thus require more trials. No matter how secure a graphical password scheme is, the password can always be found by a brute force attack. In this paper, we distinguish two types of guessing attacks: *automatic guessing attacks* apply an automatic trial and error process but *S* can be manually constructed whereas *human guessing attacks* apply a manual trial and error process.

Security Of Underlying Captcha:

Computational intractability in recognizing objects in CaRP images is fundamental to CaRP. Existing analyses on Captcha security were mostly case by case or used an approximate process. No theoretic security model has been established yet. Object segmentation is considered as a computationally expensive, combinatorially-hard problem, which modern text Captcha schemes rely on.

ADVANTAGES:

1. It offers reasonable security and usability and appears to fit well with some practical applications for improving online security.
2. This threat is widespread and considered as a top cyber security risk. Defense against online dictionary attacks is a more subtle problem than it might appear.

LIST OF PROCESS

This phase consists of the following processes:

- **Prepare for System Implementation,** where all steps needed in advance of actually deploying the application are performed, including preparation of both the production environment and the Consumer communities.
- **Deploy System,** where the full deployment plan, initially developed during System Design and evolved throughout subsequent lifecycle phases, is executed and validated.
- **Transition to Performing Organization,** where responsibility for and ownership of the application are transitioned from the Project Team to the unit in the Performing Organization that will provide system support and maintenance.

CONCLUSION:

CaRP is a new security primitive relying on unsolved hard AI problems. CaRP is both a Captcha and a graphical password scheme. The notion of CaRP introduces a new family of graphical passwords, which adopts a new approach to counter online guessing attacks: a new CaRP image, which is also a Captcha challenge, is used for every login attempt to make trials of an online guessing attack computationally independent of each other. A password of CaRP can be found only probabilistically by automatic online guessing attacks including brute-force attacks, a desired security property that other graphical password schemes lack. Hotspots in CaRP images can no longer be exploited to mount automatic online guessing attacks, an inherent vulnerability in many graphical password systems. CaRP forces adversaries to resort to significantly less efficient and much more costly human-based attacks. In addition to offering protection from online guessing attacks, CaRP is also resistant to Captcha relay attacks, and, if combined with dual-view technologies, shoulder-surfing attacks. CaRP can also help reduce spam emails sent from a Web email service.

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