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A Review on CAPTCHAS Security System

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Abstract—This paper is going to discuss about some major issues using CAPTCHAs security system. Some of the issues are given below

- Need of security in online services
- CAPTCHAs as a security system
- Application of CAPTCHAs
- Current problems in CAPTCHAs
- CAPTCHAs enhancement in user perspective.
- Conclusion.

Keywords— CAPTCHA, security, automated abuse, online service, text based, design principle.

I. INTRODUCTION

A CAPTCHA is a program that protects websites against bots by generating and grading tests that humans can pass but current computer programs cannot. This was coined in 2000 by Luis von Ahn, Manuel Blum, Nicholas Hopper and John Langford of Carnegie Mellon University [6].

CAPTCHA stands for "Completely Automated Public Turing test to tell Computers and Humans Apart." A Turing Test is a test where a computer is able to sufficiently mimic a human to the point where another human cannot tell the difference between the two [4]. CAPTCHA is the exact opposite. Its purpose is specifically to determine who is a machine and who is a human when user generated content is placed on a web site. For example, humans can read distorted text as the one shown below, but current computer programs cannot.

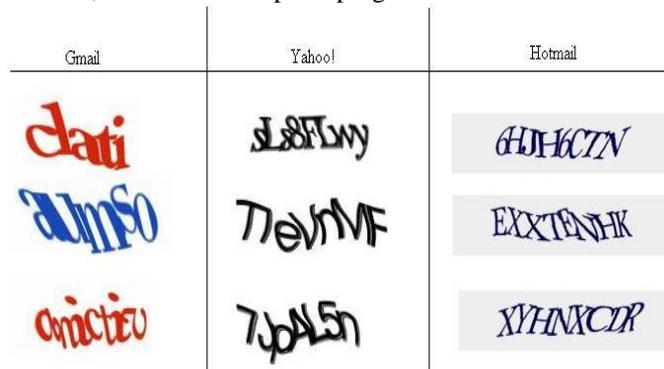


Fig.1: Text Based CAPTCHA

II. NEED OF SECURITY IN ONLINE SERVICES

In recent years, the development of the information technology sector has meant that peoples day-to-day use of the Internet has continually increased; and the convenience of Internet services has increased in kind.

Unfortunately, abusive users such as hackers can exploit these internet resources for their own purposes by using automated bots (simulated users) that can reduce the performance of online systems for legitimate users. In order to avoid this situation, it is Important to be able to distinguish between valid human users and invalid computer bots on the Internet.

III. CAPTCHAs AS A SECURITY SYSTEM

The Completely Automated Public Turing Test to Tell Computers and Humans Apart (CAPTCHA) was created to meet this need. A CAPTCHA is a form of Turing Test that distinguishes human users and computer bots automatically. The test is designed so that human users can answer any questions or challenges easily, but computer-program based imitators face considerably greater difficulty.

There are 3 basic properties that CAPTCHAs must satisfy:

- It should be easy for human users to pass.
- It should be easy for a tester machine to generate and grade.
- It should be hard for a software robot to pass.

By considering the quality or correctness of a response, a judging computer can determine whether the tested user is a human or a computer bot.

The CAPTCHA system consists of essentially four major components: -

- Selection of images
- Image Preprocessing
- Server
- User Interface

Some of the CAPTCHA are given below

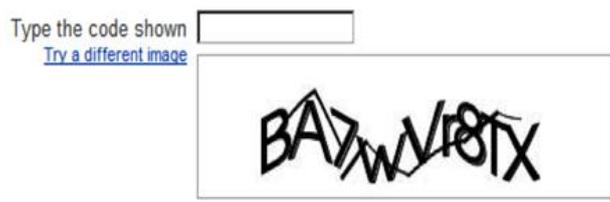


Fig. 2: An example of a typical reading-based CAPTCHA system.

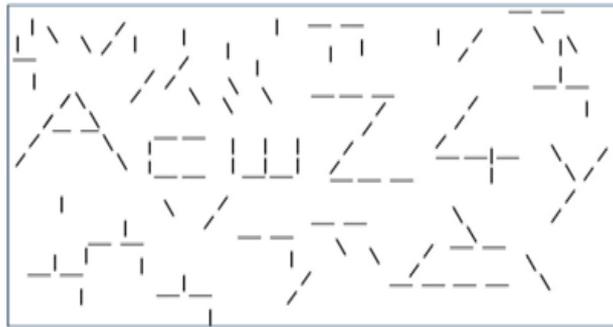


Fig. 3: An example of Bar CAPTCHA



Fig. 4: An example of Transparent CAPTCHA

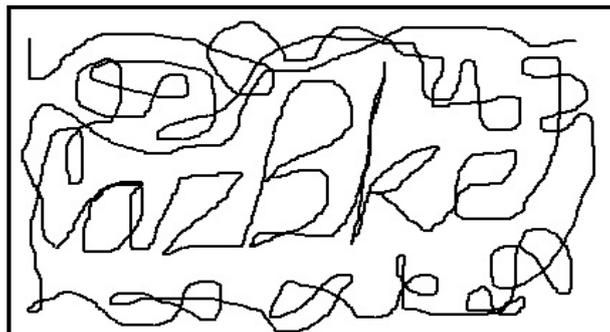


Fig. 5: An example of Thread CAPTCHA

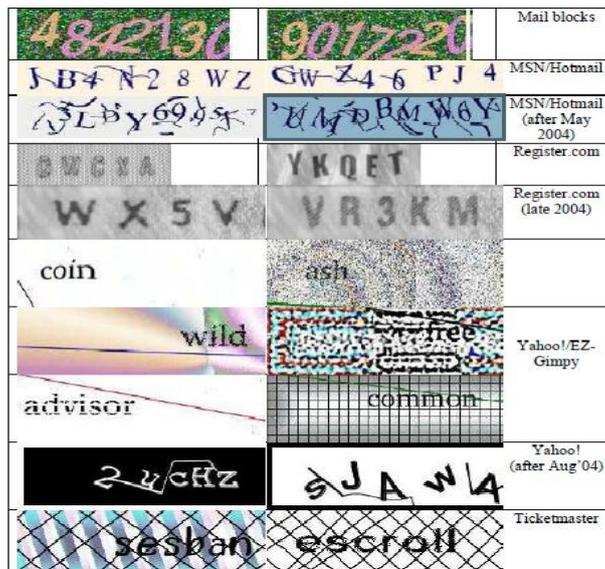


Fig 6: Examples of various character labeling CAPTCHAs

IV. APPLICATIONS OF CAPTCHAs

CAPTCHAs have several applications for practical security which is given below:-

- **Preventing Comment Spam in Blogs.**
Most bloggers are familiar with programs that submit bogus comments, usually for the purpose of raising search engine ranks of some website (e.g., "buy penny stocks here"). This is called comment spam.
- **Protecting Website Registration.**
Several companies offer free email services. Up until a few years ago, most of these services suffered from a specific type of attack: "bots" that would sign up for thousands of email accounts every minute. The solution to this problem was to use CAPTCHAs to ensure that only humans obtain free accounts.
- **Preventing Dictionary Attacks.**
CAPTCHAs can also be used to prevent dictionary attacks in password systems.
- **Search Engine Bots.**
It is sometimes desirable to keep web pages un-indexed to prevent others from finding them easily. There is an html tag to prevent search engine bots from reading web pages. The tag, however, doesn't guarantee that bots won't read a web page; it only serves to say "no bots, please."
- **Worms and Spam.**
CAPTCHA's also offer a plausible solution against email worms and spamworms and spam: only accept an email if you know there is a human behind to other computer.
- **Online Polls:** In November 1999, slashdot.com released an online poll asking which the best graduate school in computer science was. IP addresses of voters were recorded in order to prevent single users from voting more than once. However, students at Carnegie Mellon found a way to stuff the ballots by using programs that voted for CMU thousands of times. CMU's score started growing rapidly. The next day, students at MIT wrote their own voting program and the poll became a contest between voting "bots."

V. CURRENT PROBLEMS IN CAPTCHAs

As we know the CAPTCHAs system is used for security purpose from bot but this produces some complexities in CAPTCHA system

1. Complex image text used for CAPTCHA
2. Different languages around the world.
3. Large database need due to lot of attempts.
4. Resources wastage.
5. Traffic on internet

VI. CONCLUSION

In this paper we studied about different type of text Capchas . infect captchas are used for security purpose that a bot system will not be able to use a website but these captchas are unreliable to the users that are suffering from eyesight disorder (colorblindness).they are not reliable with such shades on text due to the text complaxtion in so we need a reliable captcha that must be safe from BOT systems but must be reliable for every user.

VII. CAPTCHAs ENHANCEMENT IN USER PERSPECTIVE

This is a task that will be familiar to many people as it is analogous to the simple act of sorting through physical photographs. Our system further improves traditional text-based CAPTCHAs in that it is language and written-script independent, and supports keyboard-difficult environments.

Security system must be user friendly (people).

It must not be too much complex that user is unable to read the text on different type of CAPTCHAs. The number of attempts made by user needs large number of images in the database as well as more data transfer on the network

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