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Imaged Based CAPTCHA System

Abstract: CAPTCHAs are automated test that are there to avoid misuse of computing and information resources by bots. Typical text-based CAPTCHAs are proven to be vulnerable against malicious automated program. In this paper, we present an image-based CAPTCHA system using easily identifiable human appearance characteristic that overcomes that weakness of current text-based systems. CAPTCHAs a technique used by a computer to tell if it is interacting with a human or another computer. Because computing is becoming pervasive, and computerized tasks and services are commonplace, the need for increased levels of security has led to the development of this way for computers to ensure that they are dealing with human in situations where human interaction is essential to security. Activities such as online commerce transaction, search engine submissions , Web polls, Web registration, free e-mail service registration and other automated services are subject to software programs, or bots, that mimic the behavior of human in order to skew the results of the automated task or perform malicious activities, such as gathering e-mail addresses for spamming or ordering hundreds of tickets to a concert.

In this an imaged based CAPTCHA system, not only tries to improve both security and usability of CAPTCHA, but also aims to expand the applicability of CAPTCHA. Attempt to achieve the image based CAPTCHA system goal is security and usability.

Keywords: Security, image Captcha

Introduction

CAPTCHAs are short for **C**ompletely **A**utomated **P**ublic **T**uring test to tell **C**omputers and **H**umans **A**part. A CAPTCHA is a program that protects websites against bots by generating and grading tests that humans can pass but current computer programs cannot.

For example, humans can read distorted text, but current computer programs can't: A CAPTCHA or Captcha is a type of challenge-response test used in computing to ensure that the response is not generated by a computer. The process usually involves one computer (a server) asking a user to complete a simple test which the computer is able to generate and grade. Because other computers are unable to solve the CAPTCHA, any user entering a correct solution is presumed to be human. Thus, it is sometimes described as a reverse Turing test, because it is administered by a machine and targeted to a human, in contrast to and standard Turing test that is typically administered by a human and targeted to a machine. A common type of CAPTCHA requires that the user type letters or digits from a distorted image that appears on the screen. CAPTCHAs are used because of the fact that it is difficult for the computers to extract the text from such a distorted image, whereas it is relatively easy for a human to understand the text hidden behind the distortions. Therefore, the correct response to a CAPTCHA challenge is assumed to come from a human and the user is permitted into the website.

Why would anyone need to create a test that can tell humans and computers apart? It's because of people trying to **game** the system – they want to exploit weaknesses in the computers running the site. While these individuals probably make up a minority of all the people on the Internet, their actions can affect millions of users and Web sites. For example, a free e-mail service might find itself bombarded by account requests from an automated program. That automated program could be part of a larger attempt to send out spam mail to millions of people. The CAPTCHA test helps identify which users are real human beings and which ones are computer programs. Spammers are constantly trying to build algorithms that read the distorted text correctly. So strong CAPTCHAs have to be designed and built so that the efforts of the spammers are thwarted.

Objective

In this project an imaged based CAPTCHA system, not only tries to improve both security and usability of CAPTCHA, but also aims to expand the applicability of CAPTCHA. Attempt to achieve the image based CAPTCHA system following goals:

1) Security: To resist the attack of malicious programs.
2) Usability: To increase the rate of passing the test.

The main idea of image based CAPTCHA system is randomly choosing image form the database and asking user to match it by selecting the right image form the given images.

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System Analysis

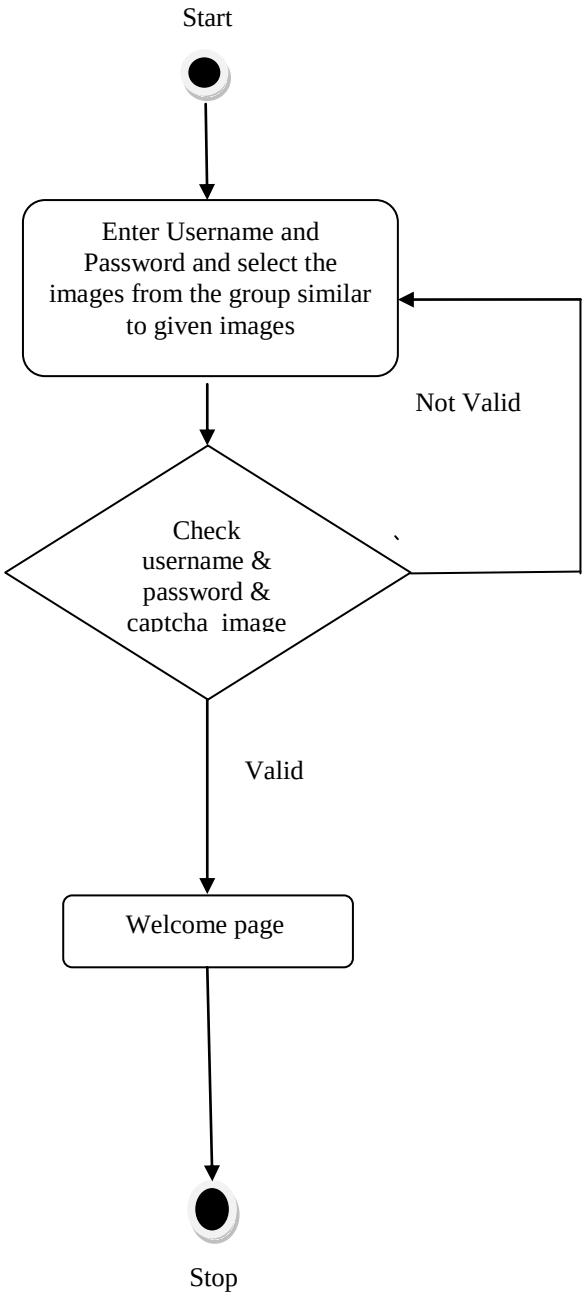
In our approach no underlying database is needed, the images are created randomly in real time. To solve our proposed CAPTCHA problem by a software robot using a brute force attach that explores every possible function in the PRF family is computational expensive and cannot be solved in a reasonable amount of time.

Other than brute force attack approach, the other option for a software robot to solve the problem is to use featured based matching techniques to find Mobius transformation between Image a and Image b. However, with the additive noise and scaling on the deformed images the solution becomes extremely difficult for feature matching algorithm.

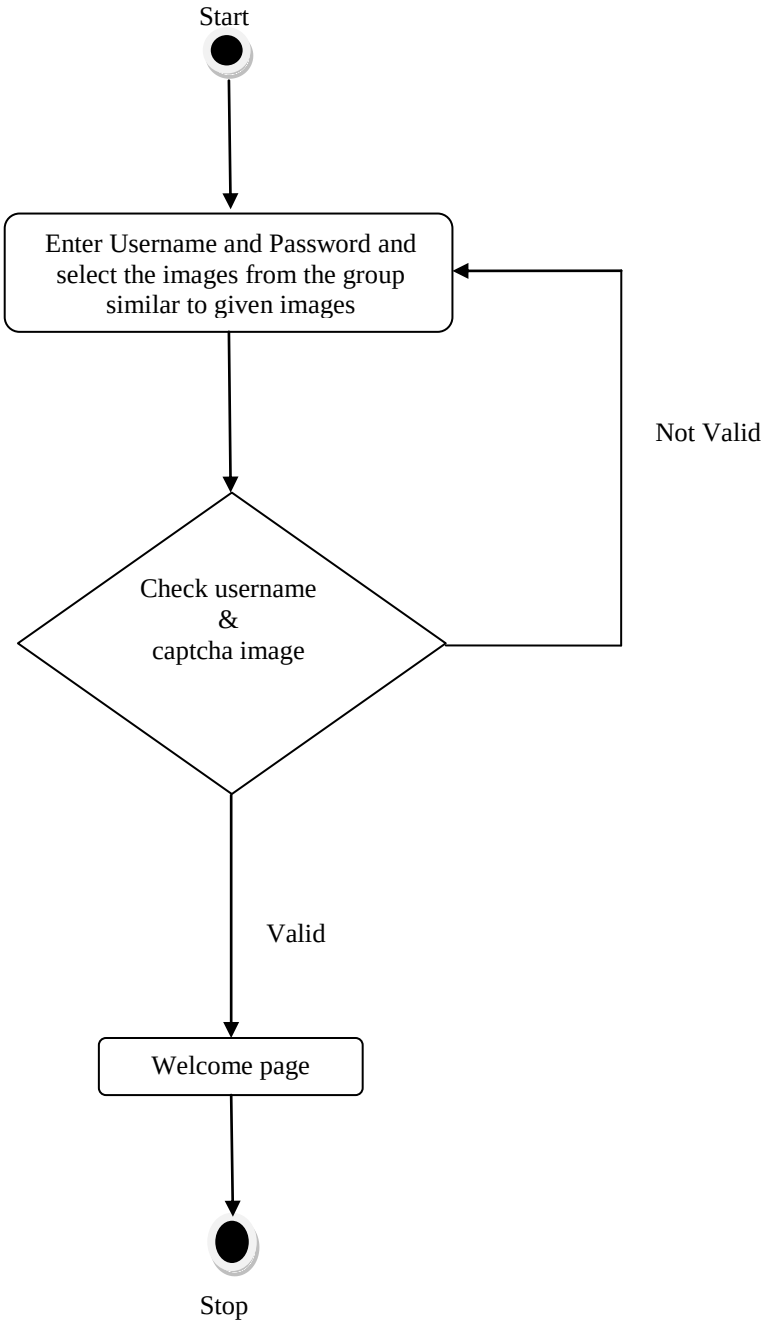
Implementation

Data Flow Charts

Login:



Registration:

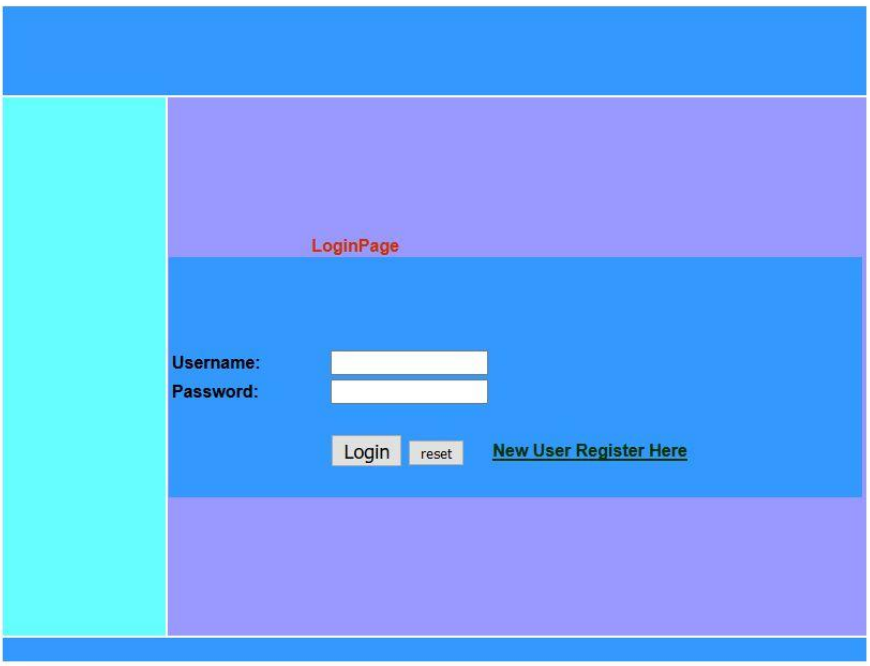


Result

Computer output is the most important and direct source of information to the user. Efficient, intelligent output design should improve the system's relationship with the user and help in decision making. A major form of the output is a hard copy from printer.

Screen Shots:

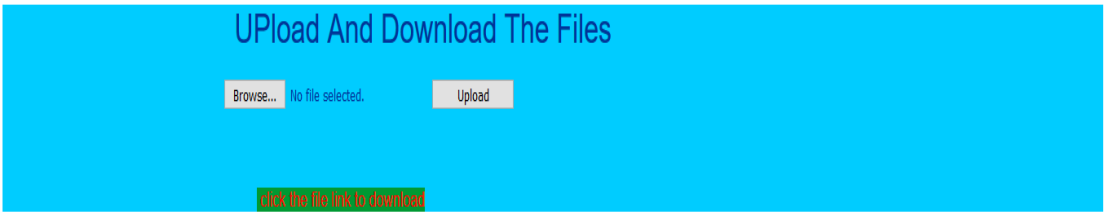
Login Page:

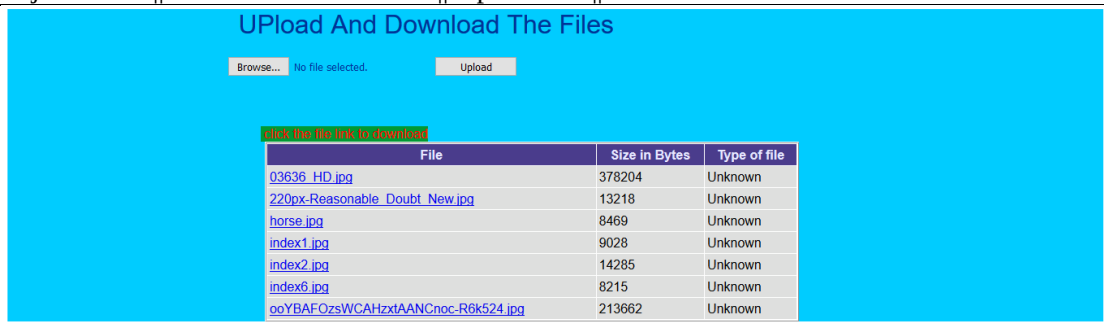


Registration Page:

Captcha:

Enter Page:





Conclusion

Captcha's are an effective way to reduce spam attacks. Applications are varied from stopping bots to character reorganization and pattern matching. A new type CAPTCHA system, Image based CAPTCHA system, has been proposed in this project. To pass the Image based CAPTCHA test, users have to choosing images from the database and asking user to match it by selecting the right images from the given images.

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