A USER AUTHORIZATION BASED ON CAPTCHA SYSTEM

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BORANG PENGESAHAN STATUS TESIS*

JUDUL: A USER AUTHORIZATION BASED ON CAPTCHA SYSTEM
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A USER AUTHORIZATION BASED ON CAPTCHA SYSTEM

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This report is submitted in partial fulfilment of the requirements for the
Bachelor of Computer Science (Computer Networking)

FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGY
UNIVERSITI TEKNIKAL MALAYSIA MELAKA
2014

DECLARATION

I hereby declare that this project report entitled

A USER AUTHORIZATION BASED ON CAPTCHA SYSTEM

is written by me and is my own effort and that no part has been plagiarized without citations.

STUDENT : _____ Date: 15 – AUG -2014

(MUHAMMAD HASIF BIN ZULKIFLI)

SUPERVISOR : _____ Date: 15 – AUG -2014

(Ms. ZURINA BINTI SA'AYA)

DEDICATION

Alhamdulillah, praise to Allah…..

En. Zulkifli bin Othman and Pn. Noor Asmah Binti Ismail,

Papa, Mama, thank you for your unconditional support and understanding….

Syahir Tarmizi, Islam Suhaimi, Shahir Shukor, Faiz Baderul Hisham, Sazli Suhaimi, Kamal Faiz and Hafizi Hasani,Azizul, Zawawi

Guys, thank you for the trust, help and care….

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ABSTRACT

Internet technology today is worldwide to make any process faster and easy. Most of internet users take the initiative to get unlimited internet service. Often users only use the service from the internet such as conducting business online transactions, comments on any web site or sign up and get involved to any discussions on the internet. So this all leads to the risk of a third person involved an attack on their self-interest or maybe from automated computer attack to destroy a system that is used by other internet users. Therefore, CAPTCHA systems have become a means to ensure the safety of users and who are directly involved. CAPTCHA system is a method that has been popularly used today in most of the company's website. The system to be developed is a new method called the Pattern CAPTCHA PATTCHA system that uses the concept of mobile lock Their telephone. The system uses a new method that uses the mouse as a vehicle for resolving questions randomly from the server PATTCHA. PATTCHA system function is to display the pattern and the user will complete the pattern by the number displayed.

ABSTRAK

Teknologi internet pada hari ini telah digunakan diseluruh dunia untuk membuat sesuatu proses dengan lebih cepat dan mudah. Kebanyakan pengguna internet mengambil inisiatif untuk penggunakan perkhidmatan yang terdapat dalam internet tanpa had.Kebiasaannya pengguna akan menggunakan perkhidamatan yang terdapat dalam talian internet seperti transaksi dalam perniagaan, memberi sebarang komen pada laman sesawang, atau pengguna melakukan pendaftaran baru untuk mendapatkan akaun diri dan melibatkan diri berbincang secara atas talian bersama dengan pengguna internet lain. Jadi semua ini membawa kepada risiko daripada orang ketiga yang akan menyerang pengguna lain untuk kepentigan diri sendiri atau mungkin dari serangan daripada pepijat computer untuk memusnahkan system yang digunakan oleh pengguna internet yang lain. Kerana itu, sistem CAPTCHA telah menjadi satu kaedah untuk menjamin keselamatan pengguna dan yang terlibat secara langsung. Sistem CAPTCHA adalah satu kaedah yang telah popular digunakan pada hari ini pada kebanyakan laman sesawang syarikat besar. Sistem yang ingin dibangunkan ini adalah satu kaedah baru yang dipanggil sistem PATTCHA iaitu Pattern CAPTCHA yang menggunakan konsep dari kunci telifon bimbit. Sistem ini menggunakan kaedah baru yang menggunakan tetikus sebagai perantaraan bagi menyelesaikan soalan secara rawak dari server PATTCHA. Fungsi sistem PATTCHA adalah dengan memaparkan pattern dan pengguna akan menyelesaikan pattern tersebut mengikut nombor yang dipaparkan.

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INTRODUCTION

1.1 Project Background

There are many security implementations that the programmer has placed into the internet services to make sure the internet user is safe to browsing website. One of the popular security methods that is available in the website or any other internet services is CAPTCHA.

CAPTCHA stands for "Completely Automated Public Turing Test to tell Computers and Humans Apart". It is a type of Challenge-response test used in computing to determine whether the user is human. Challenge-response is the authentication protocol in which one party present a question (challenge) and another party must provide a valid answer (response) to be authenticated. CAPTCHA is found in 2000 by Luis von Ahn, Manuel Blum, Nicholas Hopper and John Langford from Carnegie Mellon University.

Now-a-days internet is most widely used in all daily transactions including daily shopping, education, commerce and industrial sector. All these transactions mainly need filling of certain registration forms by entering individual information. Only after that the user is allowed to access that website. But some individuals develop programs which make false registration by filling wrong

information and access the website. It leads to the wastage of the web resources. So in this way they try to deny the services used by the regular users. These attacks are called “Denial of services”.

The CAPTCHA system use Turing test which the objective or roles between computers and humans have been reserved. The human is supposed to judge of which one is a computer or human between two user but both of user pretended to be a human and the judge has to distinguish between them. This is similarity for CAPTCHAs that they distinguish humans from computers but they differ in that the judge is now a computer and absolutely not a human.

There are many attackers in the internet that is widely used by humans and sometime can be auto generated by worm, spam or malware, search engine bots, auto generates bots and the others tool that created by humans. The example of the implementation of CAPTCHA into other practical application is free email services. The attacker of this application is absolutely worms, spam and bots. Bots can sign up for thousands of email account every minute with unlimited activities. From this situation the CAPTCHA is the one of the security method to prevent from attackers. This situation has been improved by requiring users to prove they are human before they can get a complete free email account. The other example is the Online-Polls that are exploited by automated bots so that their outcome is manipulated by auto generate bots.

The security of a CAPTCHA is based on the assumption, that underlying Artificial Intelligent (AI) problem is one that cannot be recognize by a computer. The computer will have problem to solve the characters and words from images under clutter and distortions is often used for CAPTCHAs.

CAPTCHAs can prevent bot-generated spam by requiring that the sender pass a CAPTCHA test before the email message is delivered, but the technology can also be exploited by spammers by impeding Optical Character Recognition (OCR) detection of spam in images attached to email messages. The mechanical or electronic conversion of scanned or photo images of typewritten or printed text into machine-encoded/computer-readable text. And this is how the computer

recognizes the correct answer that similarity with the OCR scanned word that display to the users.

There are many other methods differ from the CAPTCHA system that is more reliable than simple CAPTCHA. ReCAPTCHA is the example of a new method but only have little different that can consider as a different method. It is still based on the word recognition problem. The computer will use the words from scanned books and newspaper. ReCAPTCHA improves the process of digitizing books by sending words that cannot be read by computers.

CAPTCHA system can also be exploited by spammers by impeding OCR detection of spam in images attached to email messages. More specifically, each word that cannot be read correctly by OCR is placed on an image and used as a CAPTCHA. This is possible because most OCR programs alert you when a word cannot be read correctly. Each new word that cannot be read correctly by OCR is given to a user in conjunction with another word for which the answer is already known. The user is then asked to read both words. If they solve the one for which the answer is known, the system assumes their answer is correct for the new one. The system then gives the new image to a number of other people to determine, with higher confidence, whether the original answer was correct.

The goal of this project is to understand the method of internet security using CAPTCHA method which it have many security is being used to make sure the internet is safer and easy to use. In addition, there was having many methods that have been used but the internet user that will get the option to use any other method to make it suitable with the environment of the websites or any free internet services. Its mean how user can implement the security methods into their website either use a CAPTCHA system or software system. However CAPTCHA system need to be determine how it works before it develop a new security method based on CAPTCHA system

Therefore, this project will use dynamic analysis to analyze a new method for CAPTCHA. It will focus on an easy way for human to recognize with a new method to pass and for a tester machine to generates and grade and also

hard for a bot to pass. This new method that will called as PATTCHA that a user need to slide the pattern before continue to the next process or submit the form.

1.2 Research Problem

They are many problem in security method or algorithm that being use today in the internet such as websites. The basic CAPTCHA is use the basic method that sometime not have the requirements needed in the securities algorithm. Below is the project problem that can be described. The Project Problem (PP) is summarized in Table 1.1.

Table 1.1 Summary of problem statement

No	Research Problem
RP1	The CAPTCHA system easy to been hack or dis-encrypt by auto computer bot and problem to determine whether a site visitor is a human or computer bot.
RP2	The CAPTCHA system use high bandwidth of data to load.
RP3	Hard to recognize the CAPTCHA image with crowded characters and taking a long time.

1.3 Research Questions

Three Project Questions (PQ) is constructed to identify the problem statement as discussed in previous section is depicted in Table 1.2.

Table 1.2 Summary of project questions

RP	RQ	Research Question
RP1	RQ1	What is the parameter use to study the weakness of previous CAPTCHA system?
	RQ2	What is the behavior of auto bot computer attack?
	RQ3	What is the procedure to make an easy method to recognize the CAPTCHA system?

PQ1: What is the parameter use to study the weakness of previous CAPTCHA system?

This project question is to analyses which parameter is suitable to use to study on the behavior of the weakness that have in all previous CAPTCHA system. Because of different type of security method may infect to different parameter, thus it is important to analyses which method should be use.

PQ2: What is the behavior of auto bot computer attack?

This project question is to study and identify which technique is suitable to use to collect the data that use to identify the behavior.

PQ3: What is the procedure to make an easy method to recognize the CAPTCHA system?

This project question is to find out how to make a better CAPTCHA system with a new view and implementation method on majority supported browser.

1.4 Research Objectives

Based on the project questions formulated in previous section, appropriate project objectives (PO) are developed as follows in table 1.3

Table 1.3 Summary of research objectives

RP	RQ	RO	Research Objective
RP1	RQ1	RO1	To study about the authorization method and methodology as well.
	RQ2	RO2	Reduce the weaknesses of previous CAPTCHA system.
	RQ3	RO3	Recommendations of new method and guidelines based on CAPTCHA system

PO 1: To study about the security method and methodology as well.

In order to analyses the previous CAPTCHA system, first we must identify what parameter will be used to analyses the weakness of previous CAPTCHA system. Different type of previous CAPTCHA system may have different type of parameter to inspect.

PO 2: Reduce the weaknesses that have on previous CAPTCHA system.

After determine the parameter use to analyses the malware, the next step is to collect data and analyses the data to identify the behavior in order to reduce the weakness in previous CAPTCHA system.

PO3: To recommend new method of CAPTCHA based on CAPTCHA system

After get the data analysis, the data can be used to identify a new method that can be developing as a prototype for recommendation into the analysis study

1.5 Project Contributions

The contribution of this project is summarized in Table 1.4:

Table 1.4 Summary of project contributions

RP	RQ	RO	RC	Project Contributions
PP1	PQ1	PO1	PC1	The parameter use to analyses the previous CAPTCHA ystem
	PQ2	PO2	PC2	The weakness on the previous CAPTCHA system
	PQ3	PO3	PC3	The new method for recommendation

1.6 Research Scope

The project will be focused on:

a) Methodology on previous CAPTCHA system such as CAPTCHA, reCAPTCHA, PICTCHA and sound CAPTCHA.
b) Recognize, time and bandwidth data parameter
c) Using dynamic analysis
d) Develop java script code for better recognize

1.7 Project Significant

The previous CAPTCHA system will help developer in develop a method to reduce the weakness on the system.

1.8 Report organization

This report consist of six chapter namely Chapter 1: Background, Chapter 2: Literature Review, Chapter 3: Methodology, Chapter 4: Design and

Implementation, Chapter 5: Testing and Result Analysis and Chapter 6: Conclusion.

Chapter 1: Introduction

This chapter will discuss about introduction, project background, research problem, research question, research objective, scope, project significant and report organization.

Chapter 2: Literature Review

This chapter will explain related work of this recommendation system, such as type of CAPTCHA, type of attackers, analysis technique and parameter.

Chapter 3: Methodology

This chapter will explain the method use to analyse the all the previous CAPTCHA system and organise the sequence of project work in phase by phase.

Chapter 4: Design and Implementation

This chapter will introduce the software use in this project, environment setup, and implementation of recommendation new method based on CAPTCHA system as well as the data collected.

Chapter 5: Testing and Result Analysis

This chapter will analyse the collected data and carry out the parameter proposed to support the evidence.

Chapter 6: Conclusion

This chapter will concludes and discussed the finding, limitations, contribution and the future work of the project.

1.9 Conclusion

In this chapter, problem statement, questions and objective of the projects are clearly identified. The next chapter, Chapter 2 will discuss the related work of this project.