

# CAPTCHA Problems Based On AI Provide Protection against Automated Hacking Tools

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**Abstract:** CAPTCHA protects the website from web-bots by generating test that computer can-not pass only human can pass. It is completely automated public Turing test to tell the computer and human apart. CAPTCHA is simple puzzle and display the word in distorted form and only human can understand it but not any other automated tools can pass it. By the use of neural logic randomly questions are generated and answers are generated according to questions and display the AI CAPTCHA to the user enter their answer in text box and if match that answer with the background answer then user can successfully login to the next page otherwise it fails if answer will wrong . It is beneficial for people who can understand the questions but not any automated attacking tool can attack with them. We provide security to the system and are also used in various applications such as in military system, online polls, E-ticketing etc. Also it protects the data from spyware attacker. In this paper we will provide the environment that the AI based CAPTCHA is used which will provide security to our files and data. The four types of CAPTCHA will provide such as Logical, Arithmetic, Image text based and Color text. Randomly any questions are generated and solve that CAPTCHA by the human only.

**Keyword:** CATCHA, AI problems, Random, Logic.

## I. INTRODUCTION

Over the past few years, an increasing number of public web services are to prevent exploitation by bots and automated scripts, user to solve a Turing test challenge before using the service. The challenges must be easy to generate but difficult for non-humans to solve. We provide best CAPTCHA for protection against spyware which is developed by using artificial intelligent programming which carries random questions which is easy to understand for people but not understandable for machine by the use of neural logic the randomly questions and answers of that questions is generates. In this paper we are going to design a framework which will protects data from spyware attackers and automated attacking tools which is malicious for our data. Here we are going to create CAPTCHA using AI (artificial intelligence) which generates one own question and respective answer for that question will be given to user for the tackle that AI problem which is easy for human but very much difficult for machine to solve that question.

## II. LITERATURE SURVEY

### What is AI?

Artificial intelligence (AI) is the intelligence exhibited by machines or software. It is an academic field of study which studies the goal of creating intelligence. Major AI researchers and textbooks define this field as "the study and

design of intelligent agents", where an intelligent agent is a system that perceives its environment and takes actions that maximize its chances of success [1].

### What is CAPTCHA?

CAPTCHA stands for Completely Automated Public Turing-test to tell Computers and Humans Apart. It comes in several shapes, sizes and also types. These all work quite well against spam, but some are hard to solve than others, some are more fun than others, and some will benefit you monetarily on your website more than others. There are plenty of examples but the most used ones today include: word solving, audio, branded, 3D and math solutions. If one CAPTCHA system fails, the administrator might need to remove that code from his or her site and replace it with another version. As for CAPTCHA designers, they have to walk a fine line. As computers become more sophisticated, the testing method must also evolve. But if the test evolves to the point where humans can no longer solve a CAPTCHA with a decent success rate, the system as a whole fails. The answer may not involve warping or distorting text it might require users to solve a mathematical equation or answer questions about a short story. And as these tests get more complicated, there's a risk of losing user interest.

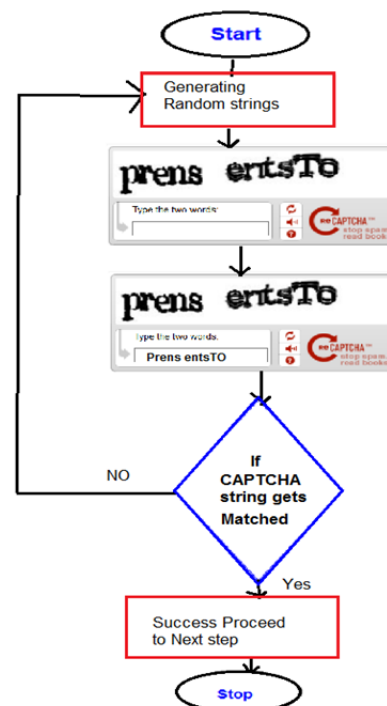


Fig.1 Flowchart of CAPTCHA

A. Types Of CAPTCHA

I) Text-Based CAPTCHA:

It represents in distortion form contains case-insensitive letters and digits. Text-based CAPTCHA is deployed in famous web-sites, examples Yahoo, Hotmail, Gmail, YouTube, PayPal etc. Gimpy, Ez-Gimpy, Baffle-Text and MSN-CAPTCHA are the types of Text-based CAPTCHA[2].



Fig.2 Text-Based CAPTCHA

II) Image-Based CAPTCHA:

Image based CAPTCHAs are challenges that involve pictures and objects that have some sort of similarity that the users have to guess. They are visual puzzle. Computer generates the puzzles and grades the answers, but is itself unable to solve. Image-based CAPTCHAs are tests in which the users have to choose those images that have some similar properties [3].

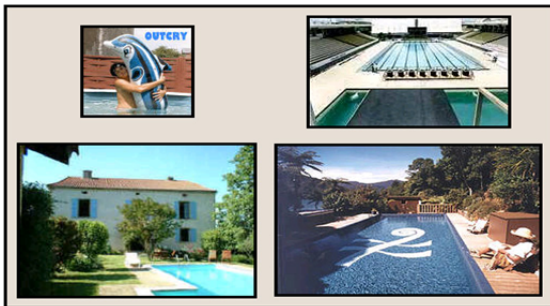


Fig.3 Image-Based CAPTCHA

III) Audio-Based CAPTCHA:

The program picks a word or a sequence of numbers at random, renders the word or the numbers into a sound clip and distorts the sound clip; then presents the distorted sound clip to the user and asks users to enter its contents [4].

IV) Video-Based CAPTCHA:

A video taken from public database that have three words that describe that video as the video plays words may submit, i.e. the user does not have to wait for the video to finish before submitting this three words [5].



Fig.4 Video-Based CAPTCHA

B. Drawbacks of different types of CAPTCHAs

**Text-based CAPTCHA:** In this type of CAPTCHAs, users that have faced some problems to enter the correct text or characters or letter. Following are the same reasons that confuse the users to identify the correct text. i. Use of various lines. ii. Use of various shapes. iii. Use of Multiple fonts. iv. Font size variation. v. Use of Blurred Letters. Text-based CAPTCHAs can be easily broken by OCR techniques. The peoples that have low visibility power cannot easily pass the test.

**Image-based CAPTCHA:** The People that have color blindness face many problems. It can be identified by Random guessing attack or Dictionary-based attack. Mislabelling of images. Large image databases or servers are required by these schemes to make the CAPTCHA. The times to make, grade and display the CAPTCHA increases the load on the server.

**Video-based CAPTCHA:** The size of files is large, so problem face by users to download video and pass that CAPTCHA test.

**Audio-based CAPTCHA:** System available in the English so end user should have a comprehensive English Vocabulary. Similar sound characters. Not working for dumb people or people that have low listening power.

**Puzzle-based CAPTCHA:** Time consuming. User cannot identify the puzzle easily [2] [5].

III. SYSTEM DESIGN AND IMPLEMENTATION:

Logic of AI based CAPTCHA'S

- I. Color text CAPTCHA
- II. Image based CAPTCHA
- III. Logical CAPTCHA
- IV. Arithmetic CAPTCHA

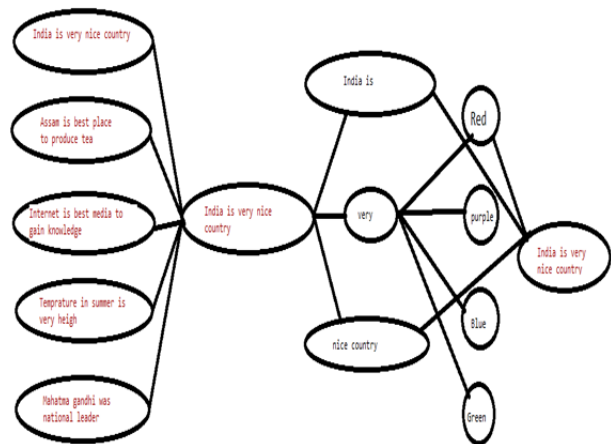


Fig.5 Color text CAPTCHA

In color text CAPTCHA, number of neurons are generated in background that contain number of sentences and pick one sentence randomly in the next neuron display the one chosen sentence and then generated the next stage in that stage three neurons are display which divided into left, right, and middle neuron first neuron, we will give the color of the middle word. In that figure, shows "very" is the middle word and this word contain number of neurons that

assign the colors. And in the last stage generate one neuron which displays the output of that sentence, by connecting that left and right neuron. The output is that the sentence will display the color of the middle neuron.

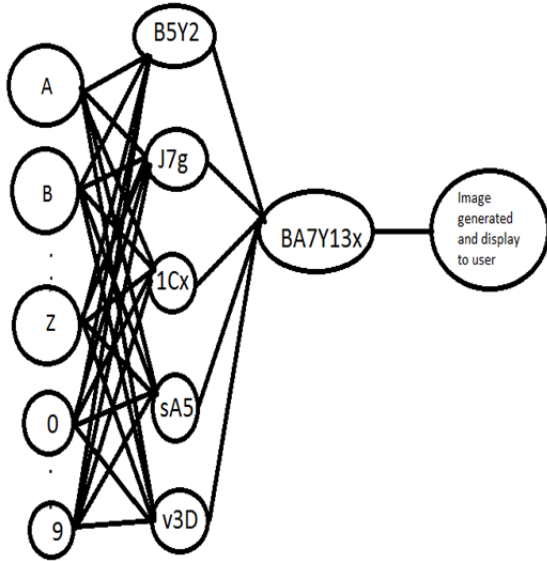


Fig 6. Image Based CAPTCHA

In the Image text based CAPTCHA, generate the number of neurons which contain A to Z or a to z letters and 0 to 9 numbers are given. In the next stage randomly pick the word and create one neuron contain one combine words and letters and in the output stage generate one image of that words and display to the user in the image format by combining the word.

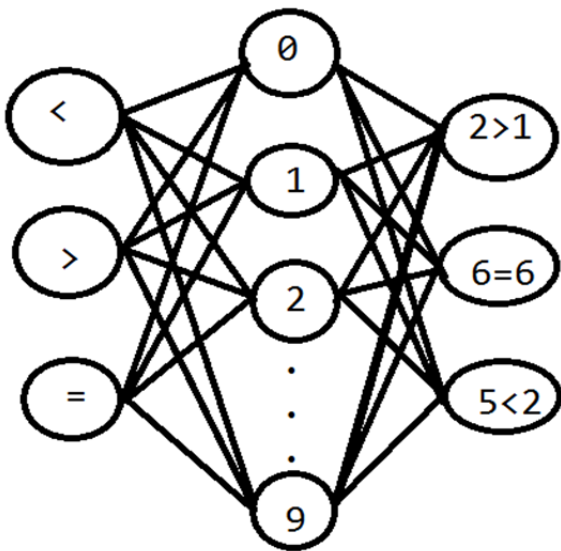


Fig7. Logical CAPTCHA

In the logical CAPTCHA, less than, greater than, equals to operations are generated in the neuron and randomly select those operations in the first stage. In the next stage generate the numbers and pick the numbers randomly then in the last stage output is formed by combining the numbers and operations

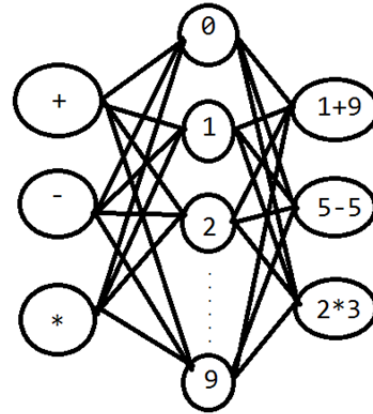


Fig.8. Arithmetic CAPTCHA

In Arithmetic CAPTCHA, generate the operations in the form of neurons and pick the number randomly and also randomly select the operations then in the last stage generate the different neurons which contain the output of that operation.

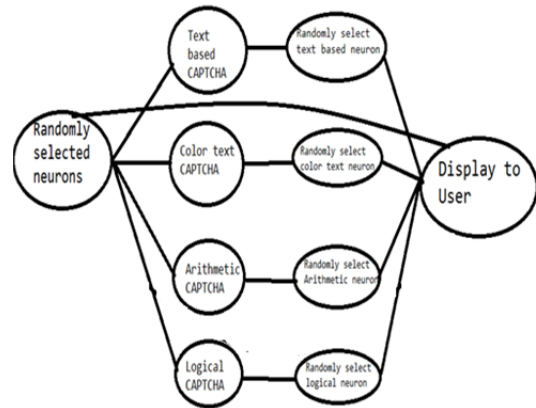


Fig.9. Combined CAPTCHA

Overall figure is display contain 4 types of CAPTCHA firstly in first neuron contain Randomly selected neuron which generates the 4 types of CAPTCHA randomly and then select those one of the CAPTCHA and each of the CAPTCHA contain one particular neuron and choose that neuron which types of CAPTCHA will produce and in the last stage display the output to the user and again this cycle will produce and again initialize the neurons randomly.

#### IV SYSTEM IMPLEMENTATION

- Step 1: Start
- Step 2: Load Neurons to All Different CAPTCHA Algorithms
- Step 3: Select One Neuron Randomly
- Step 4: Load CAPTCHA Based On Selected Neuron
- Step 5: Load Answer in Background
- Step 6: Accept Answer from User
- Step 7: If Accepted Answer Match
  - Step 7.1: Go to Step 9
- Step 8: Else Go to Step 2
- Step 9: Check User id And Password
  - Step 9.1: If Match
  - Step 9.2: Go to Step 10
  - Step 9.3: Else Go to Step 2
- Step 10: Grant Access
- Step 11: Exit

**V. RESULTS AND ANALYSIS**

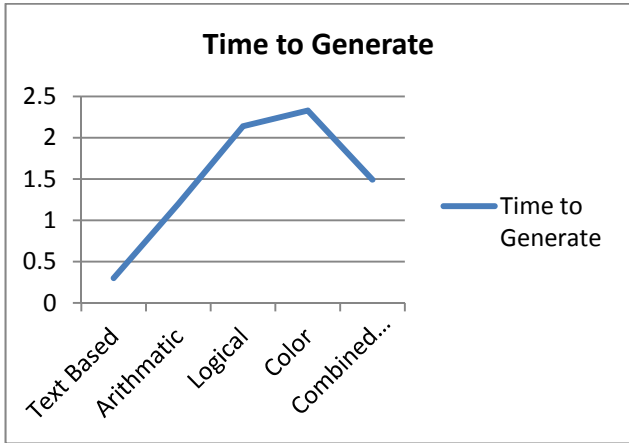


Fig10. Graph of time to generate CAPTCHA

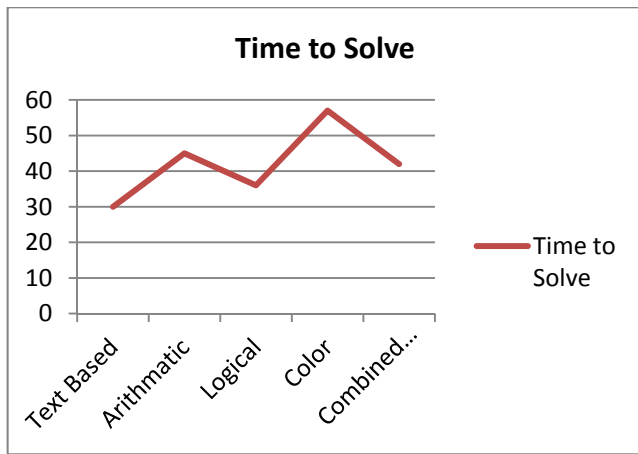


Fig11. Graph of time to solve CAPTCHA

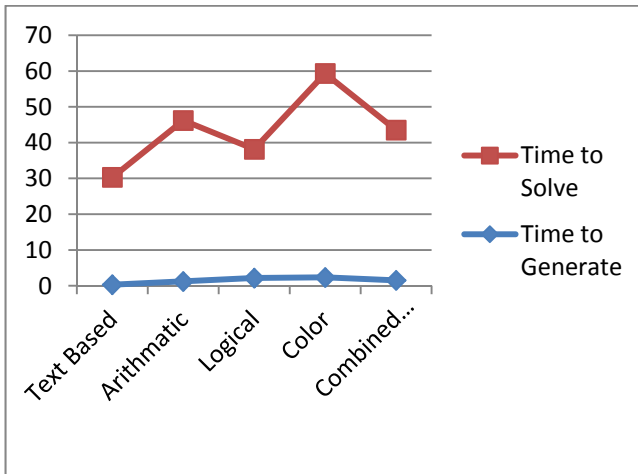


Fig12. Graph of time to solve and time to generate

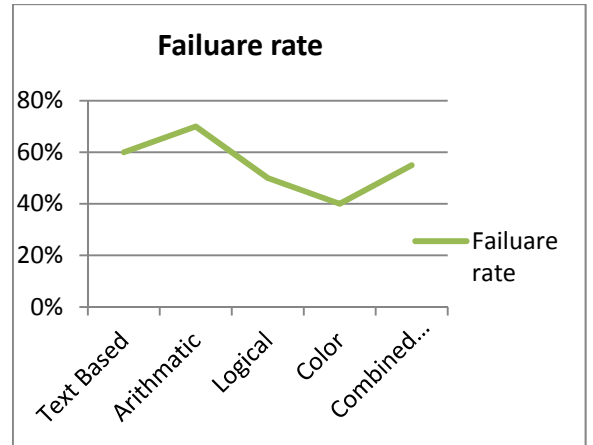


Fig13. Graph of failure rate

**VI. CONCLUSION**

Here our objective is to provide best CAPTCHA for protection against spyware which is developed by using artificial intelligent programming which carries random questions which is easy to understand solve by user but it is not understandable for the machine which means spyware, bots or any machine tools cannot solve this problem. Answer of the AI problem is typed in the textbox. These CAPTCHA this will produces best outcome from the above is unbreakable for machine hacking tools.

By the use of neural logic we generated the 4 types of operation such as, text based, arithmetic, logical, color text operation. Hence the security level will increase by providing these types of operation. Human can be easily solve those CAPTCHA and also understand the question easily.

**REFERENCES**

- [1] R.J.Solomonoff," *Some Recent work in Artificial Intelligence*",proc.of the IEEE,vol. 54,no.12,December,1966.
- [2] H. S. Baird and M. Chew, "*BaffleText: a Human Interactive Proof*," IEEE Conf. Comp.Society, pp. 20–25 ,Jun. 2012.
- [3] R. Manna et al., "*Complexity Analysis of Image-Based CAPTCHA*", in International Conference on Computing Sciences, pp. 88- 94 Punjab, 2012, IEEE.
- [4] Haichang Gao, Honggang Liu, Dan Yao, Xiyang Liu, "*An audio CAPTCHA to distinguish humans from computers*," IEEE Symp. Security Privacy, pp. 399–413 May 2010.
- [5] Ved Prakash Singh, Preet Pal," *Survey of Different Types of CAPTCHA*" International Journal of Computer Science and Information Technologies, Vol. 5 (2) , 2014, 2242-2245.