

CAPTCHA to Tackle AI Automation

Bharath VS

1RZ17MCA16

Dept of MCA

RV College of Engineering

Abstract:

The Internet has played an increasingly important role with the introduction of many Online services, such as email and search engines. They are also overwhelmed by attacks from computer programs like bots. To counter this, it is intended to differentiate between computer programs and humans. Although the mechanism provides good protection and restricts automatic web-based registration, there are many vulnerabilities in CAPTCHA the enable hackers to penetrate the system of CAPTCHA. Bot applications, CAPTCHA (Completely Automated Public Touring Check to say Computers and Human Apartments), Hackers, spammer, search engines, scrapers.

1. Introduction:

The internet contributes profoundly to many facets of human life, including connectivity, education, online commerce, etc. Some web services provide online authentication, where users provide information to link and use services such as Yahoo, Gmail and Hotmail. In recent years several types of CAPTCHA have been created. Several are based on OCR (Optical Character Recognition) as CAPTCHA text while others are based as voice and video on the Non-OCR (Non-OCR) multimedia. Any of these types of CAPTCHAs split up in new bot programs. For example, a text CAPTCHA can be broken with the use of the segmentation letters. This paper explores CAPTCHA's new forms,

classifications, and similarities based on their weakness and strength in recent papers published. This paper discusses the CAPTCHAs.

2. Background:

2.1 The CAPTCHA meaning:

A CAPTCHA is a website security program which generates tests and ratings. People can pass around, but real computer programs cannot. For example, people can read.

2.2 Doing the CAPTCHA

Website Registration Security: CAPTCHA is used to protect the various free e-mails

Services such as the Yahoo, Gmail and Hotmail login Bot systems Tens of thousands of automated script accounts each minute.

Scrapers secure email addresses: This can be achieved by concealing an email

Web scrapers address by asking the user to solve a CAPTCHA until shown And your E-mail Username.

Online polls: The use of CAPTCHAs to block web crawlers

Carry out an online poll by telling the user who wishes to vote to clear the CAPTCHA before the vote. However, this method cannot prevent users from voting multiple times.

Preventing Dictionary Attacks: This prevents computer programs repeating their CAPTCHA check after a number of unsuccessful logins across a password space. It is better than locking an account after not getting enough connections.

Search Engine Bots: Administrators can use CAPTCHAs to avoid indexing search engines so that others will not be able to access or read these sites, as they often contain private information.

3. Classification of CAPTCHAS:

CAPTCHA 's significance is a measure for user response, because it is human or app bot. And app bot could violate the credibility of a website if access is provided. You may distinguish CAPTCHAs according to the distorted forms

Whether the characters, the numbers or the pictures

CAPTCHA basing on email

CAPTCHA bases on photos

CAPTCHA bases on audio

CAPTCHAs built on screen

CAPTCHAs focused on puzzle

3.1 Text based CAPTCHA

Document oriented is easy to implement where the user is present with a sequence of letters and digits which he would enter to verify himself. Adding other character changes, such as vibration, scattering, spinning or rendering Characters in 3D shape applied to those improvements to prevent bot programs from reading the strong characters. A variety of text-based approaches are set out as below.

3.1.1 Gimpy

The technique underlying this approach is to pick and present a sequence of characters as photos blurred and twisted by adding black and white lines and rendering them non-linearly. These changes demands that the user to type the characters correctly. Gimpy got better in Works with Yahoo which was put in order to discourage

spammers from posting classified ads. For an instance: Building free e-mail accounts in chat rooms and writing scripts.



Figure 1: Example of a Gimpy CAPTCHA

3.1.2 Text in baffle

Monica Chew (UC Berkeley) and Henry Baird (PARC) developed baffle text at the Palo Alto study centre. Words which are not part of British Vocabulary are shown in this form of CAPTCHA. These words are adapted to their image, e.g. Image and scan it back in, or using the threshold technique that transfers the image from black to white colour, and back again. This increases the amount of greys and creation of noise to the picture at random. The concept behind Baffle text is to eliminate the minor issue with the dictionary use of nonsense words where humans can use inferences to solve the problem, but computers can't have systems to detect.

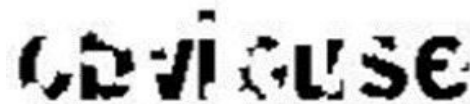


Figure 2: Example of a Baffle Text CAPTCHA

3.2 Image Based CAPTCHA

Picture based CAPTCHAs are based on the identification of a specific image from images of similarity and often, certain words are mixed up. Robot programs fail to recognize the graphics where humans can overcome that. Specific image based approaches are shown as below.

3.2.1 Bongo

This form of CATCHA allows the user to overcome user authorisation with a visual pattern recognition problem. Boxes in series are shown, one at the left and one at the right. The boxes to the left are different from those on the right and the user would recognise among that two boxes. Shows an example of system Bongo.



Figure 3: Bongo Method

3.2.2 PIX

The PIX CAPTCHA uses a broad photo database and animated pictures of everyday objects. For example, puppies, flowers etc. Four separate images of the same object are displayed and the user chooses the object which matches among all images.

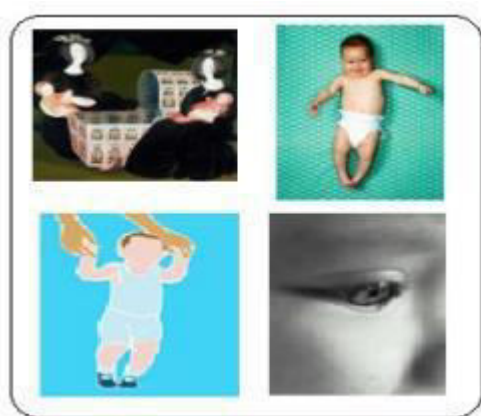


Figure 4: Pix method

3.3 Audio based CAPTCHA

In delivering words to the user in the form of a voice, CAPTCHA-based audio represents the user authentication with a set of numbers or letters which is asked to speak out what he / she has learned to listened the CAPTCHA. The Profit of any form is used by users with visual disability and other charity purposes. Below is a debate on some of the Technology.

3.3.1 Text-to-Speech communication

In this process, the user will be provided with some voice recording of a word or a number Noise and distortion added, and the user is required to type the word or number. Google makes this system for blind and visually disabled users of other Google services such as Gmail.

3.4 Video Based CAPTCHA

Video CAPTCHA is rarely used in CAPTCHA as it requires image download via CAPTCHA program Website. Below is one of the processes outlined:

3.4.1. Motion CAPTCHA

M Shirali-shahreza & S. Shirali-shahreza improved the process. A short clip of a film, the user will be shown a person performing some kind of action, after which a sequence of sentences. The user will be seen explaining different acts and the user will need to pick the right one described. If the user chooses the correct answer, the user can access the website, otherwise the system offers the user a second chance to test a new one.



Figure 4: Example of a Motion CAPTCHA

3.5 Puzzle based CAPTCHA

In the CAPTCHAs puzzle, the user needs to solve a riddle with the use chunks of picture and request to combine chunks or define a particular part of the image. All of the following The methods described in this group are as follows:

3.5.1 Multiple SEIMCHA

A CAPTCHA semantic image has several degrees of complexity in choosing a specific object in a Picture to define the upright picture orientation which is difficult for computer programs. In the paper Gossweiler et al first introduced the simple idea behind this CAPTCHA "What's up with CAPTCHA" where the user and a series of randomly rotated images were displayed The image was required to rotate until it was positioned upright.



Figure 5: Example of Multiple SEIMCHA

Using this approach, Ross et al. implemented a new CAPTCHA, based on uprightness Line drawing orientation made from a 3D model called Sketcha. A plethora of images Google 3D Warehouse was downloaded from a number of angles. Illustration 34 Sketcha approach where the user has to press to rotate the picture until it's upright.

4. Comparison types between CAPTCHAS

4.1 Pros and Cons of Text CAPTCHA

Text-based CAPTCHA is made up of English letters and numbers. So bot programs and hackers can solve the CAPTCHA text by developing programs that search text CAPTCHA and type it in the specific location. This is solved by doing some switch to characters, such as adding some noise or spinning and scattering letters or current Characters as corrupted and distorted letters or as 3D characters make such changes Since certain characters' cause problems to the user when he selects the right characters Have identical shapes after modifying.in example,

4.2 Pros and Cons of Image based CAPTCHA

Some users with poor vision or learning disabilities may face difficulties when they try to visually solve these CAPTCHA. The probability of bot programs breach the CAPTCHA will increase if the number of choices are reduced so it's best to build more CAPTCHA choices to make them solid the process will therefore consume the database.

4.3 Pros and Cons of Audio based CAPTCHA

This form of CAPTCHA is intended for people with visual difficulties, where the words are spoken out to the User and the user will type the word he / she has been listening to.

While CAPTCHA audio is available for visually disabled users, there are some problems may challenge users

The additional noise to the words reported is to make the CAPTCHA stronger and more effective to make it Bot proof, the user can be confused and the response can be inaccurate.

4.4 Pros and Cons of Video based CAPTCHA

CAPTCHA portrays a video-based clipping in the presentation of a short film. Some type of behaviour or the moments must be list of answers. The size of the video in this system is huge so that the users face difficulties when they download it. This problem will cause users to quit the website or email they tried. To make use of it. Another issue can affect some users who have no English language skills Since the CAPTCHA video is only available in English.

4.5 Pros and Cons of Puzzle based CAPTCHA

CAPTCHA puzzle reflects the introduction of sections of images and the user will combine the images Parts or mark the component of the picture in question. This method takes longer to solve. The consumer May get bored and leave this website. Users with poor vision will even face problems in solving the puzzle.

5. Conclusion

CAPTCHA plays an important role in world wide web security, where bots are smart enough to surpass the CAPTCHA and should be prevented. Hackers who misuse the infrastructure online should be avoided from authentication and spamming of the sites. This paper brings forward principles and context of CAPTCHAs, and their implementations discussed. This paper explains Current classification CAPTCHA methods for text, pictures, speech, video, and puzzle related. In every group mentioned here are addressed several varied methods. Furthermore, we spoke about the power and weakness. Ultimately, we suggest creating CAPTCHA multi-linguistics.

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