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Puzzle Based CAPTCHA for Authentication of WebChat Application

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ABSTRACT: CAPTCHA is a short form for the Completely Automated Public Turing Test to Tell Computers and Humans Apart. It is a testing mechanism that assures that only those who pass the test and not the machine produced system are allowed to proceed (bots). The goal of the CAPTCHA system is to provide innovative and validating tests that are simple for people to complete but complex for bots to solve. There are four sorts of CAPTCHA development methods: text-based CAPTCHA, image-based CAPTCHA, audio-based CAPTCHA, and video-based CAPTCHA. Text-based CAPTCHAs, which rely on the distortion of texts in the backdrop picture, are the most often used. Traditional text-based CAPTCHAs are no longer deemed secure for authentication due to the advancement of automated computer vision algorithms designed to reduce noise and segment distorted strings to make letters legible for OCR. A puzzle-based CAPTCHA system has been built utilizing an approach based on an image CAPTCHA. Then HTML, JavaScript / JQuery, and Cascading Style Sheets were used to create this form of CAPTCHA (CSS). The CAPTCHA system is created through a series of stages based on the evolutionary prototyping concept. Apps certification is intended to begin with a simple confirmation test that the user may complete.

KEYWORDS: CAPTCHA, bot, WebChat, puzzle, image, slider, chat room.

I. INTRODUCTION

The talking application has a significant influence on daily living. In modern globe, there are several talking applications. Each programme offers unique extra features that set it apart from others. These application firms compete with one another, and each release includes some competitive features. They have had a significant influence on people's lives. The basic chatting system should include both sending and receiving procedures. Messages are sent and received simultaneously in this programme using socket IO connections. This programme transforms one-way communications into multi-way conversation.

People convene in chat rooms on the Internet to engage in real-time discussions, usually around a specific topic and using screen names that hide their real identities. Chat rooms allow for free-flowing discussion among groups of individuals while maintaining anonymity. Conversations between groups in chat rooms are of special interest to communication scholars because they provide insight into communication phenomena such as group cohesion, collaboration, and parts of the dark side of communication such as cyberbullying and taunting. Because chat rooms are frequently organised by subject and demography, researchers can utilise the chat room as a filter to examine specific subjects or populations.

CAPTCHA is a short form for the Completely Automated Public Turing test to differentiate between computers and humans. CAPTCHA is a testing style that assures that only those persons who pass the test and not the system computer created (bots) are permitted to advance. The goal of the CAPTCHA system is to provide inventive and confirmation tests that are easy for people to answer and safe for bots. [1]

There have been several automated software bots and programmes that have corrupted and spammed online operations. That is why, before gaining access to public online services, a user (human) is usually required to solve a CAPTCHA.



The suggested model is an image-based Captcha that employs a dragged picture or a slider image approach based on a puzzle component. The project is carried out by moving the drag slider on the webpage, which pulls the puzzle piece to the right spot to complete the CAPTCHA.

In a slider puzzle captcha, for example, it is necessary to move a single misplaced jigsaw puzzle piece into position using the provided slider in order to complete the CAPTCHA.

When finished, the jigsaw puzzle makes a full picture. CAPTCHA is a reaction test that ensures the reaction is created by a human rather than a self-operating computer. The CAPTCHA, which is created automatically by the computer, is difficult for a machine to decipher but is readily answered by humans (user).

II. RELATED WORK

Many individuals are familiar with captcha verifications thanks to text-based challenges, mathematical problems, audio and video-based captcha, and so on (however, these are traditional approaches to verification). CAPTCHA verification does not usually rely on a large database to verify an individual's identification (whether it's a bot or a genuine user).

The most common type of CAPTCHA is text-based, which relies on the distortion of text in the background image. Because of the evolution of automated computer vision algorithms designed to decrease noise and segment distorted strings to make letters visible for OCR, traditional text-based CAPTHCAs are no longer considered secure for authentication.

III. METHODOLOGY

The WebChat Application has three modules.

1] The Entry page where the users are required to input their username and the name of the chat room that they want to join. Our application consists of 6 different rooms from which users can choose to join.

2] The Captcha which is an image based puzzle captcha which is solved by sliding the slider, which in turn moves the jigsaw piece into position. This is used to prevent the bots from gaining entry into the chat room.

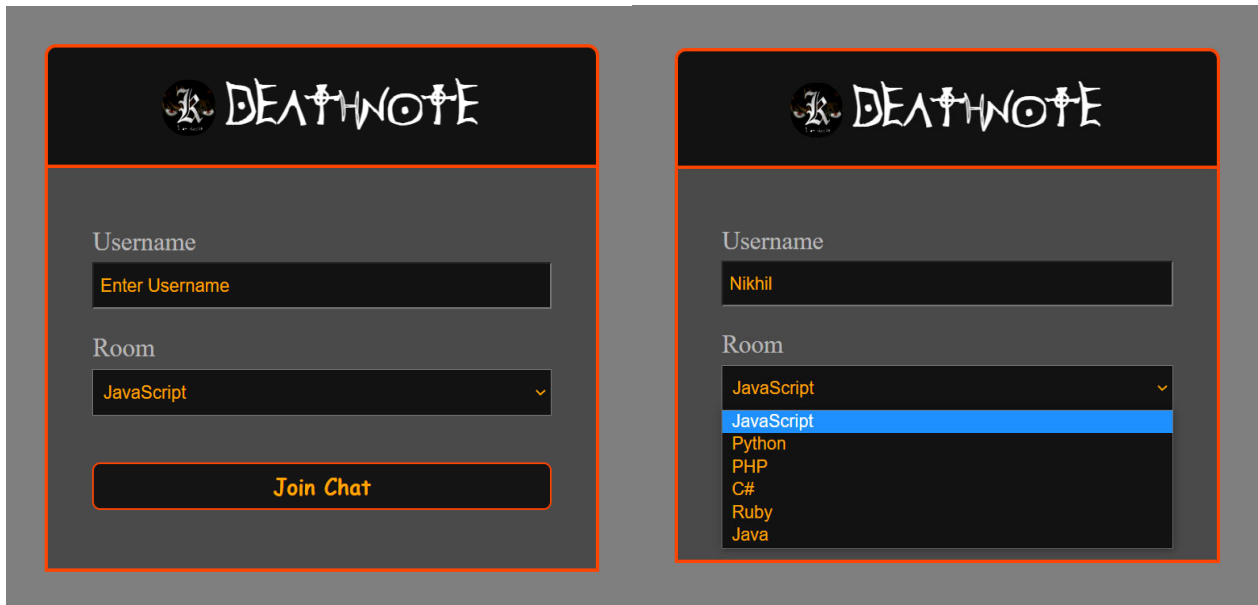
3] The Chat room where the number of users and the name of the room is displayed. This is the main page of the application where the communication takes place and messages are exchanged.

The authentication procedure begins with the user viewing the using the CAPTCHA system, which is built on a problem. A user should drag the slider which in turn drags the unsolved puzzle piece into position. If the image has been organized in a right sequence and place, that user will be authorized as a human. If there is an error in the placement of the image, that user will not be authorized as a human. However, that user will be provided with a new set of image that needs to be solved.

After solving the captcha, the username as well as the room name is then given to the server. The server, then sends these credentials to the client so that the chat room can be created. When the chat room is created, a chat bot is programmed which welcomes the user to the chat room. As the users join and leave the chat room, messages are exchanged between the client and the server, and the server broadcasts messages (status of the user/users) to every user present in the chat via the chat bot including the time at which the action takes place.

IV. EXPERIMENTAL RESULTS

In this application, users who want to join a chat room must provide their username as well as the name of the chat room they want to join. The username and chat room name are transferred to the captcha page after providing the above-mentioned information by clicking the "Join Chat" button. To prevent spam bots from accessing the chat room, a sliding puzzle captcha is now employed. The Slider Puzzle Captcha approach is more secure than the more often used alphanumeric captcha.

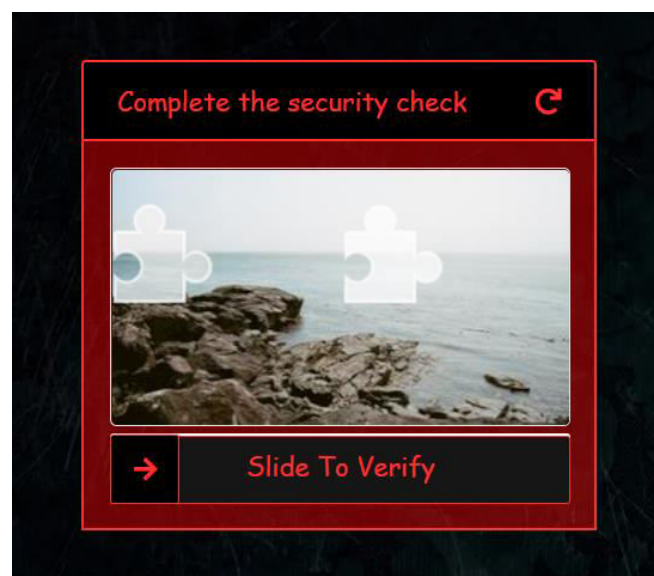


(a)

(b)

Fig. (a) Is the main page of our web chat application which prompts the user to enter the username and the room that they want to enter.

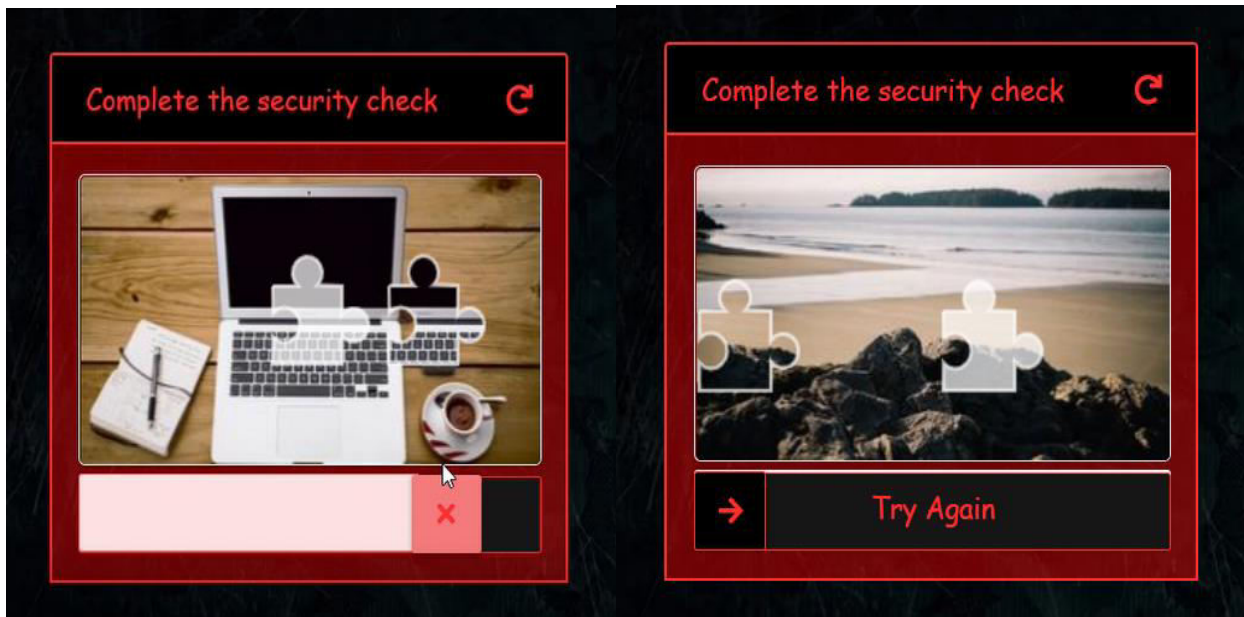
Fig. (b) Shows the different rooms available in the chat room. The user can choose any one of the rooms that they want to enter.



(c)

Fig. (c) Shows the captcha that the user has to solve in order to gain access to the chat room.

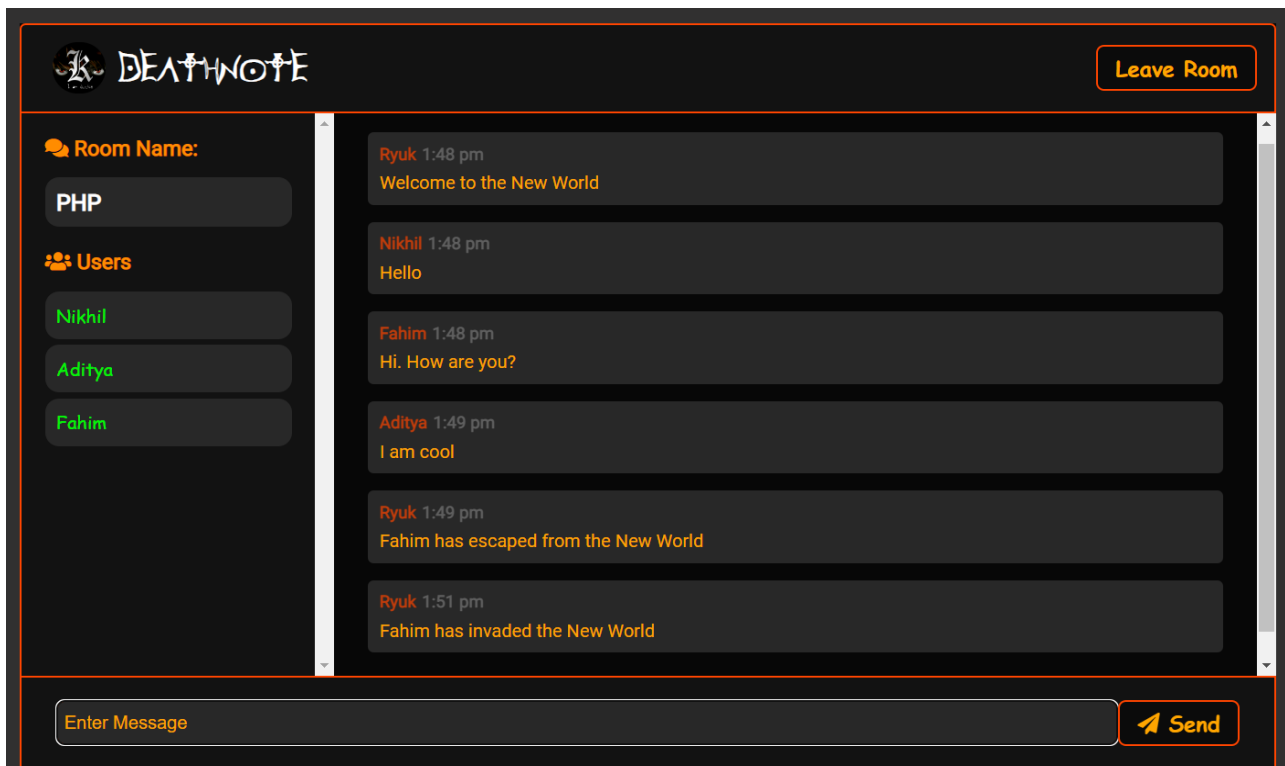
After solving the captcha, the user is then given access and taken to the chat room. CAPTCHA prevents the bots from gaining access and intruding the chat room. This ensures that only genuine human users are able to enter the chat room.



(d)

(e)

Fig (d) and (e) shows the captcha refreshing and loading a new image with the position of the jigsaw puzzle changed prompting the user to try again.



(f)

Fig. (f) Shows the chat room where users can interact with each other.



A Chat Bot has been programmed in the web chat application that welcomes the user to the chat room as well as informs the user about the number of users present in the current chat room. It also notifies the user whenever a user or multiple users join or leave the chat room.

V. CONCLUSION

We built a WebChat application and protected it using a puzzle-based captcha. Bots are effectively detected by the CAPTCHA, which stops them from entering the chat room. With the aid of socket io connections, we were able to start and define conversation between users in chat rooms. As a result, the image/puzzle-based captcha will make the online environment more secure and bot-proof. CAPTCHAs may also be used in e-commerce sites and other websites to guarantee that they are functioning properly by lowering server load by blocking bots from obtaining access to the websites.

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