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Morse Code Based Secured Authentication System Through Artificial Intelligence

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ABSTRACT: Data science is a multidisciplinary blend of data inference, algorithm development and technology in order to solve analytically complex problems. Data science is used by almost all the industries like educational institutions, finance, healthcare, business to handle large volume of data. The practical applications range from predicting stock movement to predicting cancer; used in image processing to identity recognition, audio processing for speech to text prediction. Since most of the people in the world are facing problems in the field of authentication and security. We are able to provide a real time eye tracing for password authentication for people who authenticate themselves using Morse code Advancement in the technology of authentication and authorization has be supported in the 21st century a lot as we know. Personal identification numbers (PIN) are widely used for user authentication and security since the late 90's. Since PIN numbers can be easily crack able these days, we prefer to follow different approach. PIN authentication with hands-off gaze-based PIN entry techniques, on the other hand, leaves no physical footprints behind and therefore offer a more secure password entryoption Gaze-based authentication refers to finding the eye location across sequential image frames, and tracking eye center over time. Password authentication will done using Morse code, where numbers will be represented in dots and dashes. This model presents a real-time application for gaze-based PIN entry, and eye detection and tracking for PIN identification using a smart camera

KEYWORDS: Gaze-based Authentication, image frames, tracking eye centre, web camera, eye aspect ratio.

HISTORY: Officially launched in 1999, the OpenCV project was initially an Intel Research initiative to advance CPU-intensive applications, part of a series of projects including real-time ray tracing and 3D display walls. The main contributors to the project included a number of optimization experts in Intel Russia, as well as Intel's Performance Library Team. In the early days of OpenCV, the goals of the project were described as:

- Advance vision research by providing not only open but also optimized code for basic vision infrastructure. No more reinventing the wheel.
- Disseminate vision knowledge by providing a common infrastructure that developers could build on, so that code would be more readily readable and transferable.
- Advance vision-based commercial applications by making portable, performance- optimized code available for free with a license that did not require to be open or free themselves. The first alpha version of OpenCV was released to the public at the IEEE Conference on Computer Vision and Pattern Recognition in 2000, and five betas were released between 2001 and 2005. The first 1.0 version was released in 2006. In mid-2008, OpenCV obtained corporate support from Willow Garage, and is now again under active development. A version 1.1 "pre-release" was released in October 2008. The second major release of the OpenCV was on October 2009. OpenCV 2 includes major changes to the C++ interface, aiming at easier, more type-safe patterns, new functions.

And better implementations for existing ones in terms of performance (especially on multi-core systems). Official releases now occur every six months and development is now done by an independent Russian team supported by commercial corporations. In August 2012, support for OpenCV was taken over by a non-profit foundation OpenCV.org, which maintains a developer and user site.

I. INTRODUCTION

Throughout history technology has been the drive of change. From movable type, to television, to the online, technology has been embraced and incorporated into our daily lives. Within the constructs of civilized society, the vast rewards of technological innovations have far outweighed the negatives. With the improved technology comes other ways during which we'll make our lives better and more efficient. This led to the introduction of the many branches, one of them is Data Science. To place it in simpler words Data science is that the study of where information comes from, what it represents and the way it are often became a valuable resource within the creation of business. Mining large amounts of structured and unstructured data to identify patterns can help an organization rein in costs, increase efficiencies, recognize new market opportunities and increase the organization's competitive advantage. Machine learning may be a field of computing that always uses statistical techniques to offer computers the power to "learn" (i.e., progressively improve performance on a selected task) with data, without being explicitly programmed. Machine learning is employed during a variety of computing tasks where designing and programming explicit algorithms with good performance is difficult or infeasible. Within the world of data analytics, machine learning could also be a way used to devise complex models and algorithms that lend themselves to prediction. These analytical models allow researchers, data scientists, engineers, and analysts to "produce reliable, decisions and results" and uncover "hidden insights" through learning from historical relationships and trends within the info. Usable security cares with the study of how security information should be handled within the system, both at the interface and within the backend process, without discarding consideration for resources and costs.

Balancing usability and security to understand optimal result has been defined by the principle of psychological acceptability. Consistent with this principle, a security mechanism shouldn't make accessing a resource, or taking another action, harder than it'd be if the security mechanism weren't present. this suggests that a security mechanism should add as little as possible to the matter of the user's performing some action. Here the perception of "difficult" should account for the talents, knowledge and mental models of the system users. In essence, for security to be more usable, it's to be less noticeable. This project takes account of all those factors and tries achieve a result that's easily attainable by any user that interacts with our system.

Currently there aren't plenty of amenities for disabled people within the planet which helps them to be incorporated within the traditional society. Our system hopes to scale back that burden on them and makes sure that they are more integrated with the society.

II. MAIN OBJECTIVE OF THE PROJECT

1. To create a secure system to authenticate users who are not completely blind.
2. To create a secure password authentication system which uses Morse code.
3. To make sure that the specified parts of the face are recognized accurately by the system.
4. By utilizing Morse code, which involves transmitting information as a series of on-off tones or lights, the system can add an extra layer of security compared to traditional text-based authentication methods. Morse code patterns can be more difficult to intercept or decode by unauthorized parties.
5. Morse code signals can be more resilient to interference or noise, making them suitable for environments where other forms of communication may be unreliable or prone to disruption, such as in remote areas or during emergencies.
6. AI algorithms can adapt to the unique timing and rhythm of each user's Morse code input, making the authentication process more personalized and difficult to replicate by impostors.
7. With AI, the system can continuously learn from user interactions and feedback, improving its accuracy and ability to distinguish between legitimate users and potential intruders over time.
8. Morse code-based authentication can be combined with other authentication factors, such as passwords or biometric data, to create a multi-factor authentication system that offers even greater security.

III. LITERATURE SURVEY

[1] Quantitative Analysis of Tennis Experts Eye Movement Skill [2] proposes measurement the attention movements of an actual expert athlete and a beginner athlete. The measured eye movements of the players are compared and analyzed. the attention movements are recorded using an eye-tracker. Main observation made during this paper is that beginners have a bent to follow the ball unconsciously for a flash.

[2] Smart-Eye Tracking System [3] proposes a sensible Eye tracking system which is meant for people with disabilities and elder people. The concept of this research is to use eye movement to regulate appliances, wheelchair and

communicate with caretaker. this technique comprises four components, imaging processing module, wheelchair•controlled module, appliances•controlled module and SMS manager module. The image processing module consists of webcam and C++ customized image processing, the attention movement image is captured and transmitted to Raspberry Pi microcontroller for processing with OpenCV to derive the coordinate of eye ball. The coordinate of eye ball is employed for cursor control on the Raspberry Pi screen to regulate the system

[3] Besides the attention movement, the attention blink is applied during this system for entering a command as once you press, Enter button on keyboard. The wheel chair controlled module may be a cradle with two servos which will be moved to 2 dimensions and also adaptable to other wheelchair joysticks. this technique also remotely controls some appliances and communicate with caretaker via send message tosmartphone

[4] Extension of Desktop Control To Robot Control By Eye Blinks using SVM [4] proposes to issues related issues associated with Accessibility, which should eliminate, or a minimum of reduce, the space between disabled people and technology. For severely-impaired persons, there are still many challenges that be overcome. We present eye tracking as a valuable support for disability in the accomplishment of hands-free tasks. Moreover, we stress the potentials of eye-based interfaces to reinforce the user-machine interaction process in “traditional” activities supported keyboard and mouse. Through the online of a number of the projects we’ve recently developed a robot which can move consistent with the movements of the eye balls and can be triggered with some actions supported the eyeblinks.

[5] Eye Movement Related EEG Potential Pattern Recognition For Real Time BMI proposes study which aims at rapid BMI (Brain Machine Interface) pattern recognition for the eye ball movement, which is taken into account to be removed factor from EEG (Electroencephalogram) as artefact. We investigated the repeatability of eyeball movement ERP (Event related Potential) and therefore the characteristics, which possess steady, high voltage and 50ms rapid reaction. As ERP pattern discriminator, this paper proposes 3 methods to extract and distinguish characteristic patterns induced by several directional ocular movements.

[6] Eye Contact Game Using Mixed Reality For The Treatment of youngsters attentively Deficit Hyperactivity Disorder [6] proposes an observation where many children with ADHD perform poorly in their academics. They also face difficulty in their social lives thanks to lack of attention and also thanks to lack interpersonal skills and sometimes continues to their adult life. Considering the matter this paper offers an answer where they need introduced and demonstrated the advantages of a replacement sort of treatment, an eye• contact game which successfully exploits mixed reality technology.

IV. METHODOLOGY

The principle of this system is eye pupil detection and eye tracking based on computer vision technology. A new algorithm introduced for detecting the eye pupil location by Image processing. In this technique, several stages are used to find out the movement of eye, such as face detection, eye detection, edge detection, hough transformed, motion detection and object tracking. During the initial stage, the system captures the images by web camera. The first step is to detect the user face. A system indicates and represents the face of user in a specific area of image. After that, system will perform several operations of image processing to track the eye pupil.

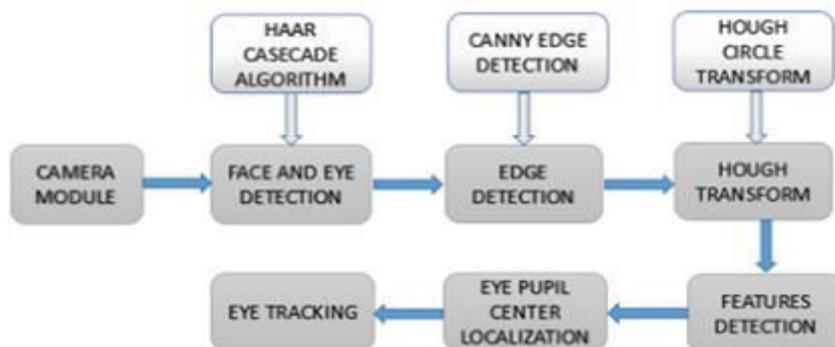


Fig 4.1: System Processing

The figure 4.1 represents the complete methodology of proposed system. Firstly, the camera will capture the image and then the face detection takes place. After the detection of the face, the the eye on the face are detected, which is a region of interest.

The system will crop the eye region initially and it will detect the eye center point. Corner detection method is applied to find out the regions of eye corners. The distance between the eye region corner and eye pupil center are measured using coordinates system logic. According to the eye pupil movements, the distance measured will vary. A minimum distance indicates the eye pupil is moved towards the left, and maximum values indicates the eye moved on right and if there is no movements of the eye, then it concludes that eye is in the middle position. After tracking the eye pupil position, the data is taken by the system. The entered data is compared with the trained dataset. If the entered data is not matched with the trained data then the system will display an error message as “unauthorized access” else the system confirms and allows for further transaction.

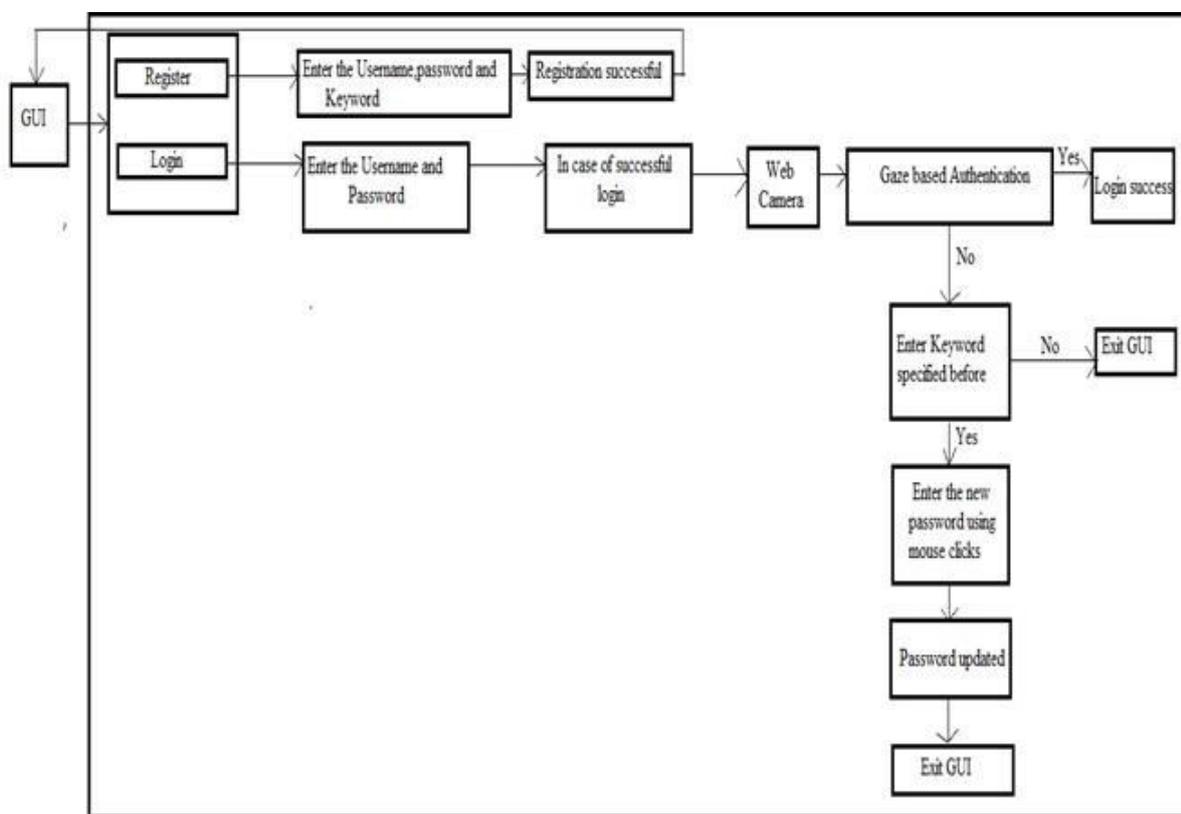


Fig 4.2: System Architecture

V. EXISTING SYSTEM

Advancement within the technology of authentication and authorization has been supported within the 21st century. Personal identification numbers (PIN) are widely used for user authentication and security since the late 90's. Since PIN numbers are often easily crackable lately, we like better to follow a different approach. PIN authentication with hands-off gaze-based PIN entry techniques, on the opposite hand, leaves no physical footprints behind and thus offers a safer password entry option.

VI. PROPOSED SYSTEM

The model consists of an interface and rear database. GUI is made such the user can interact with the system. Pygame or OpenCV is employed in to make it.

- In the frontend firstly the user got to register by providing a user id of choice, a password (PIN) and a keyword. After registration the user can log in by using the credentials i.e. user id and password. With the assistance of an internet camera the PIN is taken as input within the sort of Morse.
- In the backend, the entered PIN is checked with the stored PIN which was entered into the database by the user while registering. If the entered PIN isn't correct, it exits the screen. If the entered PIN is correct, it displays successful authentication . If the user has forgotten his password then he can use the keyword to authenticate and update the prevailing password with a replacement one.

VII. APPLICATIONS

- Eye trackers provide better security compared to any biometric authentication.
- Eye trackers are the instruments that measure the visual activities.
- It makes possible for physically disabled users to interact with computers using their eyes.
- Our main motivation is provide authentication process for people from kids to old people, which includes physically challenged people.
- Military and Defense: Morse code can be used for secure communication between military personnel, and AI algorithms can enhance encryption and decryption processes, ensuring message integrity and confidentiality.
- AI algorithms can analyze and verify Morse code inputs, preventing unauthorized access. Financial Institutions: Morse code-based authentication can add an extra layer of security to financial transactions and communications. AI can detect and prevent fraudulent activities by analyzing Morse code patterns.
- Morse code authentication can be implemented in IoT devices to prevent unauthorized access and control. AI can manage authentication processes and detect anomalies in device communication.

VIII. ADVANTAGES

1. Morse code authentication systems can provide a high level of security, as they rely on unique patterns of dots and dashes for user identification. When combined with artificial intelligence algorithms for encryption and decryption, these systems can offer robust protection against unauthorized access and data breaches.
2. Morse code can be transmitted through various mediums, including audio, visual, and tactile methods. This versatility makes Morse code authentication suitable for a wide range of applications, from military communications to IoT devices. Low Bandwidth.
3. Morse code requires minimal bandwidth compared to modern digital communication methods, making it suitable for use in environments with limited bandwidth availability or high levels of interference.
4. Morse code signals can often be transmitted and received even in noisy or adverse conditions, thanks to its simple yet distinctive encoding scheme. Artificial intelligence algorithms can further enhance signal processing capabilities, improving resilience to interference and noise. Ease of Implementation: Implementing Morse code-based authentication systems is relatively straightforward and cost-effective, as it does not require complex hardware or software infrastructure.
5. Morse code authentication systems can be user-friendly, especially for individuals with disabilities or limited dexterity. AI-powered interfaces can provide adaptive feedback and assistance, making it easier for users to interact with the authentication system.
6. Morse code authentication systems can scale to accommodate large numbers of users and devices without compromising performance or security. AI algorithms can optimize system scalability by efficiently managing authentication requests and resources.
7. Morse code authentication systems can be compatible with legacy communication equipment and protocols, allowing for seamless integration with existing infrastructure. AI algorithms can bridge the gap between Morse code-based systems and modern digital technologies, ensuring interoperability and compatibility.

IX. CONCLUSION

Our project basically provides two factor authentication. Two factor authentication is actually providing two layers of security guard an account or system. Here we are making use of gaze based authentication and click on so on convert numbers or ASCII document thereby increasing the security. This project is additionally helpful for disabled people so on authenticate. People from kids to old people can make use of this model who have basic knowledge on morse code. For blind people, there are keyboards with braille dots present on each button. Concerning the long run enhancement we attempt to implement face recognition for each user, there will be no need to enter the password within the least. We are also trying to deploy this model in government sectors, with less number of steps required for authentication .

REFERENCES

- [1] <https://ieeexplore.ieee.org/document/8343528>
- [2] <http://www.jetir.org/papers/JETIR1703020.pdf>
- [3] Mukremin Ozkul, Ilir Capuni (2018). "Police-less multiparty traffic violation detection and reporting system with privacy preservation", IET Intelligent Transport Systems, Vol. 12 No. 5, pp.351-358.
- [4] Rhen Anjerome Bedruz, Aaron Christian P. Uy, Ana Riza Quiros, Robert Kerwin Billones, Edwin Sybingco, Argel Bandala, Elmer P. Dadios (2019). "A Robotic Model Approach of an Automated Traffic Violation Detection System with Apprehension" 2018 IEEE 10th International Conference on Humanoid, Nanotechnology, Information Technology, Communication and Control, Environment and Management (HNICEM), pp.1-4.
- [5] Samira.ElsagheerMohamed(2019). "Automatic Traffic Violation Recording and Reporting System to Limit Traffic Accidents: Based on Vehicular Ad-hoc Networks (VANET)". 2019 International Conference on Innovative Trends in Computer Engineering (ITCE), pp. 254-259.
- [6] Report on Automated Traffic Monitoring System Prepared By National Police Mission Ministry of Home Affairs, Govt. of India



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