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A Unified Deep Learning Model for Morse Detection and Recognition

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ABSTRACT: PIN authentication with hands-free gaze-based PIN entry techniques, on the other hand, doesn't leave any physical footprints behind and is more secure than a PIN entry method that requires you to touch the screen. According to this method, you look at a series of images and find where your eyes are. You then keep track of your eye centre over time. Morse code will be used for password authentication. Dots and dashes will be used to show the numbers. People can enter their PINs with their eyes, and a smart camera can detect and track their eyes so they can be identified. This model shows how these things work in real time. Here, we show how to use Morse code and eye blinks to set up a password for a safe and private account that only they can access.

KEYWORDS: Morse code, Face recognition technique , Gaze-based authentication.

I. INTRODUCTION

In practically every industry, including education, healthcare, and finance, deep learning is utilised to manage massive volumes of data. Image processing, identity identification, audio processing for voice recognition, and text prediction are just a few of the many practical uses. Since the majority of the world's population has authentication and security issues. For users who use Morse code to verify themselves, we can give a real-time eye tracking for password authentication. As we all know, the 21st century has seen a lot of advancement in authentication and authorisation technologies. Authentication and security have been bolstered by the widespread usage of personal identification numbers (PINs) since the late 1990s. We'd rather take a different strategy in light of the ease with which PIN codes may now be cracked. A more secure way to enter a password is via the use of PIN authentication using hands-off gaze-based PIN input approaches. Gaze-based authentication is the process of locating the centre of the subject's eyes in a series of images and then monitoring that position over time. Morse code will be used to authenticate passwords, with numerals represented by dots and dashes. An eye-based PIN input application and eye detection and tracking for the recognition of PINs using a smart camera are shown in this model.

II. EXISTING SYSTEM AND THEIR DRAWBACKS

A. Real-time Eye Tracking for Password Authentication

In order to leverage the smart camera's eye recognition and tracking to identify a user's PIN, they have developed a real-time application. This system's main downside is that it requires the user to input a pin by looking at it. The letter or number-based pin is the most vulnerable.

Analysis of Vision-based Text Entry using Morse Code generated by Tongue Gestures

This is a Text Entry Interface that uses Computer Vision to identify tongue protrusion motions. It is necessary for the user to validate that the result presented on screen is what they want since Computer Vision technologies may not always function flawlessly.

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C. Morse code Generator Using Microcontroller with Alphanumeric Keypad

Morse code, the first technique used in radio telegraphy, may be utilised in this framework to send and receive vital messages using an alphanumeric keypad and LCD screen. Because of the Morse code's complicated encoding pattern and ON-OFF keying methodology, this method has a major flaw: it may not be able to handle it.

PROBLEM STATEMENT

The main objective is to propose a framework by using a morse code and eye blinks for setting up a password for the creation of secure and private account. Gives catchphrase and less using of hardware sensors which is using in nowadays.

OBJECTIVES

- Project goal is to develop a password authentication system that leverages Morse code for security.
- Usage of face recognition technique for the safety and security purpose. To make sure that the required parts of the face are recognized accurately by the system
- The password will be setup with the eyeblinks.
- There will be a less usage of hardware devices like keyboard etc.

II .LITERATURE SURVEY

Using a deep learning framework called Deep Morse, ZHONGHUA SUN et al. [1] demonstrate how to recognise morse signals in wideband data without any prior knowledge of the signals' presence. The initial step should be to create a multi-signal sensing module that can automatically collect candidates' signals from the wideband spectrum. Then, using a CNN-based module, we were able to extract useful characteristics from the found candidates, allowing us to tell the difference between a morse signal and other modulation patterns. Set up a testbed using commercial long-distance wireless communication equipment to examine the proposed DeepMorse model.

An overview of deep learning frameworks is provided by Kingshuk Mukherjee et al. [2]. Even if the patient's IQ is mostly undamaged, he or she often loses the capacity to interact effectively with the outside world. A person's relatives and friends are also in a state of acute anguish as a result of this. It's possible to create bespoke Augmentative and Alternate Communication (AAC) devices that utilise signals from the patient and turn them into data that can be transmitted, but these devices are very costly and almost impossible for most individuals to afford. This system, which scans and translates the patient's eye blinks into an internationally recognised communication code known as Morse code, has been constructed at an exceedingly cheap cost.

A Text Entry Interface based on the detection of tongue protrusion motions using Computer Vision algorithms was suggested by Luis Ricardo Sapaico et al. [3]. Morse Code is deciphered using a camera, which is used to recognise tongue motions that are read as Morse Code "dots" and "dashes," respectively. One of the drawbacks of using an encoding approach for text input is the need to memorise the code in advance. The user is presented with an on-screen chart that delivers instant visual feedbacks in order to speed up the system's use. With this 30-character chart, we've created a dichotomic search table that matches the tongue motions perceptually. Moderate specifications provide a theoretical speed of 1.44 WPM. In fact, the experimental results were 50% faster than the predicted speed. Despite the fact that we have only tested our interface with two users, we have found that performance improves as the user's degree of skill rises.

Several image processing approaches and fuzzy algorithms, such as colour extraction, advanced morphology, particle filter, edge detection, membership function, fuzzification and defuzzification, etc., have been proposed by Shih-Chung Chen et al. [4].In order to demonstrate a real-time mouth image recognition-based image Morse code text input system which offers an usable communication interface for the impaired. Open/closed mouth state is extracted using image recognition from dynamic mouth photos captured with a web camera with a USB port. Morse code tone/silent space may be tallied and detected by fuzzy algorithms based on the time duration of open/close mouth state.

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Open and close your lips in front of a webcam, and you may enter letters on the computer's screen to perform the operations of word processing. The experiment findings show that if the participant is willing to tolerate a period of instruction in advance, great accuracy may be achieved.

A smart home security system based on the Internet of Things was created by Chin-Tan Lee et al. [5] utilising an electronic lock that encodes and decodes optical signals modulated using Morse code standards (IoT). This investigation focuses on three areas: 3.cloud monitoring system, optical Morse code encoder, optical Morse code decoder. Light-emitting components (e.g., Smart phones) may be used as the encoder, while photoresistors and a microcontroller can be used as the decoder. This lock's data may be uploaded to the cloud service platform over Wi-Fi for remote monitoring even if the user does not have access to a personal computer. The optical Morse code-based electronic lock was shown to be very resistant to varied lighting conditions in the workplace, and all of its operations, including coding, emitting, receiving, decoding, uploading, and cloud monitoring, were found to perform well. Also worth highlighting is that in addition to saving money and time by integrating a smart phone with an old-fashioned key, the system's user-friendly interface makes it acceptable for people of all ages.

According to Dalmasius Ganjar Subagjo et al [6], Morse code is still being used by military and amateur radio groups to communicate. They created a digital Morse code signalling system that uses intermittent light to make it simpler. To acquire an equipment that can be used for Morse code communication. Measuring voltage and current when the gadget is in operation can help you determine how well it works. Also, while the gadget is charging, monitor voltage and current to get an idea of how much time it has left. According to this data, a standard battery charger can recharge the battery in five hours, whereas a solar cell can do it in 10.55 hours, as seen above. The battery can be used in flashlight mode for 18.83 hours and in SOS mode for 22.62 hours, according to the results of an electrical load test. It is possible to create the word "SOS" 9499 times and 28497 characters using this gadget..

Bopanna Jaswanth Kranthi *et al*. [7] proposed an innovative, Morse code based two-way communication system with four user accessible modes. The four modes are determined to provide speech to morse vibrations and morse to speech conversion. That is embedded with touch, gesture, vibration, microphone, and speaker modules coupled with a micro processing unit. An S-morse dictionary convert Morse code pattern read from the touch sensor to voice and speech from microphone to morse vibration . A gesture recognition model using the SVM algorithm is implemented for the selection of the user-accessible modes. The system modes also send and receive text data from android application through a cloud network. The received and send data will be converted into vibrations of morse code pattern and voice forms respectively.

The method is strengthened by validating morse conversion, machine learning algorithm accuracy, gesture recognition accuracy, morse time analysis for alphabets, word and gesture analysis for mode selection.

According to [8] researcher Paparao Nalajala et al. Morse code, the oldest means of radio telegraphy, is the subject of a proposed study. As a result of today's modern telecommunications networks, this method is deemed obsolete. In distant places where cellphone networks are nearly non-existent, travellers, sailors, and villagers require the most dependable means of communication. Morse code has a complicated encoding scheme and an ON-OFF J38 Keying mechanism, which may make it difficult for them to understand. They may utilise this gadget if simply the ability to read and write numbers and letters is required to communicate. An alphanumeric keyboard as well as an LCD screen will allow them to send and receive vital communications. The gadget is capable of encoding and decoding Morse Code messages thanks to its Microcontroller.

Alex Rupom Hasdak *et al*. [9] —Gives outline of an alternative method for deaf and mute persons to communicate is provided. Devices like the DeafVibe allow deaf and mute persons to communicate with others using their tactile senses and gestures, making it easier for them to interact with others. Morse code-based vibrotactile output is provided by the gadget. Morse code signals are generated using a built-in Morse code conversion table from the speech message. Vibration motors embedded in the fingertips of a wearable glove are powered by these signals. Wearing the glove, a deaf person may feel the vibrations in his or her fingertips and so comprehend what is being said. If you're mute, you may still use this gadget to communicate with others by bending your fingers in a certain pattern in the Morse code. Using a text-to-voice synthesiser, the flex sensors inside the glove fingers detect finger movement and create electrical signals that are subsequently translated into text and heard as audio communications. Deaf and muted persons may utilise the wearable, low-cost, and efficient technology in their daily life as an effective means of communication.

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Chin-Tan Lee *et al*. [10] has proposed to use the Internet of Things to implement this system (IoT). An electronic lock with an ultrasonic Morse code for use in a home security and access control system. Mobile phones were used in an ultrasonic Morse coding experiment. Once the receiver's password has been verified to be valid by microphone and microcontroller decoding, Wi-Fi is used to upload information about the unlocking persons and activities. Use of Moving Average of Median Filter to analyse microphone sound signals such that the unlocking device is free from external noise impacts is a method for determining ultrasonic Morse code. Four parts make up this research: This includes a Morse code generator, a decoder, a digital filter, and an integrated cloud monitoring system for the MediaTek Cloud Sandbox. Testing showed that even in a loud environment, the suggested electronic lock was capable of performing all of its functions, including coding and transmitting/receiving/filter/decode/upload/remote monitoring/all of these. Users of all ages may benefit from the user-friendly design of the operating system..

Dr. A.Murugan and others [11] Cloud computing is the foundation of the proposed system. On today's IT business, the ability to store and exchange data in the cloud has become a need. Benefits for both service providers and customers abound with cloud computing. Cloud computing security has proven to be difficult to achieve. DNA sequences are encoded using Morse code and zigzag patterns to enhance data security and secrecy in a cloud environment. The attacker has a far more difficult time stealing original data when using Morse code and the Zigzag pattern. Data encryption and decryption accuracy has been tested.

Ricky L et al. [12] provide an overview of Morse code, one of the first forms of telecommunications that is currently seldom used owing to the proliferation of mobile, viral communications. Morse codes may be readily tapped with one's fingertips, although possibly no one is aware of this nowadays. To get around this, a prototype was created using a combination of the traditional Morse coding idea and digital image computing's finger gesture recognition. The prototype uses a camera to take a series of video frames and then converts the related Morse codes into legible ASCII characters or emotive symbols by recognising finger motions. Special conversations or dialogues, which are not permitted to be spoken publicly or clearly, might be the focus of the crucial work Based on empirical methodologies for Morse code input, the maximum recognition rate of up to 93% may be achieved using finger gesture recognition.

Co-authors of [13] C.P Ravikumar IoT-based system proposed. Modern electronic devices increasingly have user-interfaces based on touchpads, haptics, and gesticulations. A HAM radio interface may be built using a touch pad. Systems that allow users to communicate information inside buildings may be built using low-power, short-range wireless communication interfaces that are now accessible in current microcontrollers. Originally designed for telegraphy, Morse code is easier for people with disabilities to use than keyboard-based interfaces. Rehab facilities, nursing homes, and hospitals might all benefit from such an interface. Morse code is another another area where it may be put to good use. There are no hard and fast rules on how long a drag should last or how much time should elapse between two drags while using Morse code signalling. The technology will be used by a variety of people at various speeds. The use of machine learning and fuzzy logic to lessen the likelihood of Morse code misinterpretation and adapt to diverse users. In order to demonstrate, they utilised the Texas Instruments MSP430F5529 development kit that includes a touchpad as well as an LCD screen and a radio interface. The system is low-cost and energy-efficient, and it satisfies the application's real-time speed requirements.

As Mehrube MEHRUBEOGLU et al. explains, personal identification numbers (PINs) have become a common method of user verification and security. Physically entering a PIN into a password-protected system is subject to password-cracking methods like shoulder surfing or thermal monitoring. On the other hand, hands-off gaze-based PIN input procedures leave no physical traces and provide an enhanced level of security when entering a password.

When a user's eyes are tracked over time, they are authenticated using gaze-based authentication. Application for PIN entering employing a smart camera and eye detection and tracking for PIN recognition.

The eye movements of tennis pros and novices were contrasted and examined by Sota Shimizu et al. [15], who offered a case study on eye motions as a kind of motion skill. To prepare the subjects for "inside-out shot" or "down-the-line shot," they are shown videos of professional tennis players. It focuses on statistically measuring the movement of the eye between the two groups. An eye-tracking gadget records the movement of each subject's gaze throughout time. That are tested after being changed using a basic parametric model of the tennis forehand shot. And one of the outcomes of the experiments was that novices prefer to pursue a tennis ball after the players in the movies have shot it, which is different from specialists.

Using remote desktop eye trackers, Peter Shevchenko et al. [16] provide a solution to the problem of data quality. In the event of bad eye tracking data, a real-time feedback system notifies participants and enables them to reposition themselves in front of the eye tracker as soon as possible. Over the course of an experiment, this permits the researcher to collect more meaningful data. In addition, a Raspberry Pi was used to gather and analyse real-time eye tracker data. A light emitting diode (LED) above the computer display was used to map the quality of data from each eye. The quality of eye tracking data was mirrored by the LED's colour, with green representing good quality and red indicating bad quality. Compare the quality of the

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data for individuals who did not use the system while completing a cognitive activity to see whether the system was successful. Those participants who used the feedback system saw an improvement in the quality of their data. The findings show that by employing remote desktop eye trackers, users may get real-time data quality comments.

At least some of the barriers to technology use for impaired individuals may be eliminated or reduced, according to a review of Accessibility problems by B. Naga Soundari et al [17]. For the most seriously disabled, there are still numerous hurdles to surmount. Disabilities may benefit from eye tracking in the performance of hands-free activities. Enhancing user-machine interaction in "conventional" tasks using keyboard and mouse with eye-based interfaces. It has recently been invented a robot that can move depending on the movement of the eyes and can be activated by various activities based on the blinks.

Ms.R Revathy et al. [18] offered study on the possibility that an attacker may obtain a user's password if they entered it in a public location. In a busy area, the PIN entering might be more easily detected by nearby opponents. A cryptography prevention strategy has been developed to address this issue.

Because of its simplicity and accessibility, the PIN entry was elegant among them. Human-to-human shoulder surfing attacks are the primary emphasis of the BW technique. The odd numbers on a well-organized numeric keypad are coloured. Entering a PIN digit may be done by pressing the colour key of the user's choice. Humans' limited cognitive powers cause the IBW approach to be deemed secret when used to human names. It has also been demonstrated to be resistant to any hacking assaults.

GazeTouchPass, a multimodal technique described by Mohamed Khamis et al. [19], combines sight and touch for mobile device user authentication that is shoulder-surfing resistant. During the authentication process, GazeTouchPass supports passwords with several input modalities. In order to crack this system's password, an attacker must keep an eye on both the device's screen and the user's eyes at the same time. GazeTouchPass's security and usability will be tested in two separate experiments with real people. Compared to single-modal authentication, GazeTouchPass is usable and substantially more secure against simple and complex shoulder-surfing assaults.

A system based on iType was suggested by Zhenjiang Li et al. [20]. Private information may be entered using just the user's eye gaze on commodity mobile platforms. At the heart of the concept are three key issues: As a result, iType's gaze tracking accuracy is not as high as it might be, as well as the difficulty of fixing input mistakes owing to a lack of comparison with the genuine text entry value. A collection of useful techniques, including utilising the collective behaviour of the findings of gaze tracking, unique correlation of the spatial distributions of typing errors, and motion sensor suggestions from mobile devices, are all part of this. iType's robustness and reliability have been improved using a variety of improvement strategies. Implementing iType on iOS will help condense designs and make them easier to use. Tests reveal that iType is capable of secure typing with excellent keystroke detection accuracy and a quick latency.

III. CONCLUSION

Authentication and security issues are plaguing individuals throughout the globe. The majority of them advocated a new method of password authentication and security. And even then, there are certain to be restrictions. Using Morse code and eye blinks, we came up with a framework for creating a password for a safe and private account that only the holder can access. Morse code will be used for password authentication, with dots and dashes representing the digits. Real-time gaze-based PIN entering and eye recognition and tracking utilising a smart camera are shown in this model.

REFERENCES

1. YE YUAN , ZHONGHUA SUN, ZHIHAO WEI, AND KEBIN JIA “Deep Morse: A Deep Convolutional Learning Method for Blind Morse Signal Detection in Wideband Wireless Spectrum” By IEEE conference in 2019,volume 7, 10.1109/ACCESS.2019.2923084.
2. Kingshuk Mukherjee, Debdatta Chatterjee “Augmentative and Alternative Communication Device Based on Eye-Blink Detection and Conversion to Morse-Code to Aid Paralyzed Individuals” By International Conference on Communication, Information & Computing Technology (ICCICT), in 2015, 978-1-4799-5522-0/15 ©2015 IEEE
3. Luis Ricardo Sapaico and Makoto Sato “Analysis of Vision-based Text Entry using Morse Code generated by Tongue Gestures”4th International Conference on Human System Interactions, By IEEE 978- 1-4244-9640-2©2011 IEEE.
4. Shih-Chung Chen 2 Chung-Min Wu 1 Shih-Bin Su “Image Morse Code Text Input System” 4th International Conference on Intelligent and Advanced Systems (ICIAS2012) in 2012 By IEEE, 978-1- 4577-1967-7/12©2011 IEEE

| e-ISSN: 2320-9801, p-ISSN: 2320-9798| www.ijircce.com | |Impact Factor: 7.542

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| DOI: 10.15680/IJIRCCE.2022.1002014 |

5. Chin-Tan Lee1, Tung-Chun Shen1 , Win-Der Lee2 , Ko-Wei Weng „A novel electronic lock using optical Morse code based on the Internet of Things" 2016 International Conference on Advanced Materials for Science and Engineering (ICAMSE) By IEEE, ISBN 978-1-5090-3869-5
6. Dalmasius Ganjar Subagjo, Abdurahman Nurhakim, Renaldi Anggriawan "Digital Portable Morse Code Signaling Device Based on Intermittent Light "2018 International Conference on Radar, Antenna, Microwave, Electronics, and Telecommunications (ICRAMET) BY IEEE, 978-1-5386-6519-0/18 ©2018 IEEE
7. Boppana Jaswanth Kranthi;Gangireddy Suhas;Kantheti Bharath Varma;G.Pradeep Reddy" **"Two-way communication with morse code medium for people with multiple disabilities"** 7th Uttar Pradesh Section International Conference on Electrical, Electronics and Computer Engineering (UPCON) By IEEE in 2020
8. Paparao Nalajala;Bhavana Godavarth;M Lakshmi Raviteja;Deepthi Simhadri "Morse code Generator Using Microcontroller with Alphanumeric Keypad" International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT)By IEEE in 2016, 978-1-4673-9939-5/16/$31.00 ©2016 IEEE
9. Alex Rupom Hasdak;Istiaq Al Nur;Adnan Al Neon;Hasan U. Zaman "Deaf-Vibe: A Vibrotactile Communication Device Based on Morse Code for Deaf-Mute Individuals" 9th IEEE Control and System Graduate Research Colloquium (ICSGRC)By IEEE in 2018, 978-1-5386-6321-9/18©2018 IEEE
10. Chin-Tan Lee;Chia-Chun Wu;Bo-Rui Su;Tung-Chun Shen" **A novel electronic lock using ultrasound Morse code based on FIR filter"**International Conference on Advanced Materials for Science and Engineering (ICAMSE)By IEEE in 2016, ISBN 978-1-5090-3869-5
11. A. Murugan;R. Thilagavathy" "Cloud Storage Security Scheme using DNA Computing with Morse Code and Zigzag Pattern" **"**IEEE International Conference on Power, Control, Signals and Instrumentation Engineering (ICPCSI)By IEEE in 2017, 978-1-5386-0814-2/17/$31.00 ©2017 IEEE
12. Ricky Li;Minh Nguyen;Wei Qi Yan"Morse Codes Enter Using Finger Gesture Recognition**"**International Conference on Digital Image Computing: Techniques and Applications (DICTA)By IEEE in 2017, 978-1-5386-2839-3/17/$31.00 ©2017 IEEE.
13. C. P. Ravikumar;Manikanta Dathi "A Fuzzy-logic based Morse Code Entry System with a touch-pad interface for Physically Disabled Persons**"** BY IEEE Annual India Conference (INDICON) in 2016, 978- 1-5090-3646-2/16/$31.00 ©2016 IEEE
Mehrube Mehrubeoglu;Vuong Nguyen" Real-time Eye Tracking for Password Authentication "By IEEE International Conference on Consumer Electronics (ICCE) in 2018, 978-1-5386-3025-9/18/$31.00 ©2018 IEEE
14. Sota Shimizu;Takumi Kadogawa;Shu-ichi Kikuchi;Takumi Hashizume" Quantitative Analysis of Tennis Experts' Eye Movement Skill" IEEE 13th International Workshop on Advanced Motion Control (AMC)By IEEE in 2014, 978-1-4799-2323-6114/$31.00 ©2014 IEEE
15. Peter Shevehenko, Noah Faurot, Christian Barentime **"**Improve data quality from remote eye tracking systems using real time feedback**"** System and Information Engineering Design Symposium (SIEDS) By IEEE in 2020
16. Naga Soundari;M. Nandakumar;R. Nivetha;K. Rajakumari" Extension of Desktop Control to Robot Control by Eye Blinks Using Support Vector Machine (SVM)"International Conference on Recent Trends in Information Technology (ICRTIT) By IEEE in 2011, 978-1-4577-0590-8/11/$26.00 ©2011 IEEE
17. Ms. R Revathy1, Mrs.R.Bama2 "Advanced Safe PIN-Entry Against Human Shoulder-Surfing" IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 17, Issue 4, Ver. II (July – Aug. 2015), 10.9790/0661-17420915
18. Mohamed Khamis1 , Florian Alt1 , Mariam Hassib1,2 , Emanuel von Zezschwitz1 , Regina Hasholzner1 , Andreas Bulling "Gaze Touch Pass: Multimodal Authentication Using Gaze and Touch on Mobile Devices" May 07-12, 2016, San Jose, CA, USA ACM 978-1-4503-4082-3/16/05
19. Zhenjiang Li;Mo Li;Prasant Mohapatra;Jinsong Han;Shuaiyu Chen "iType: Using Eye Gaze to Enhance Typing Privacy"
20. IEEE INFOCOM 2017 - IEEE Conference on Computer Communications By IEEE in 2017 , 978-1-5090- 5336-0/17/$31.00 ©2017 IEEE

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