

Eye Blink Detection System using Haar Cascade Technique

Florance G¹, Kanneboyina Vaishnavi², Segu Vaishnavi Devi³ and Kottam Vishal Reddy⁴

¹⁻⁴Department of Computer Science and Engineering, New Horizon College of Engineering,
Bangalore, India

Email: vijiflorance59@gmail.com, vaishukanneboyina17@gmail.com, vaishnavisegu26@gmail.com,
kottamvishalreddy@gmail.com

Abstract—The AI field, which can be momentarily characterized as empowering PCs make effective expectations utilizing past datasets. It has displayed an amazing advancement as of late with the assistance of fast expansion in the capacity limit and handling power. AI is a subfield of man-made brainpower. Rather than depending on express programming, it is a framework through which PCs utilize a monstrous arrangement of information and apply calculations to prepare on-to show themselves and make expectations. Since the vast majority on the planet are dealing with issues in the field of confirmation and security. We can give a continuous eye following for secret phrase confirmation for individuals who verify themselves utilizing morse code. Morse code both of two frameworks for addressing letters of the letters in order, numerals and accentuation marks by a course of action of dabs, runs and spaces. The first morse code utilized examples of specks and runs to address a couple of the letters, while the worldwide morse code utilizes spots and short runs for all letters. Initially, we really want to identify a human face only face identification. By applying AI calculations, we can identify the human face. Primarily this is more relied upon eye flicker so when we are distinguishing face, we really want to recognize the eyes. So, we can count the eye flickers given by client utilizing morse code.

Index Terms— Eye blink, Morse code, face detection, Machine learning, Eye Detection.

I. INTRODUCTION

To provide a platform for the physically challenged and disabled people by which they can create a secure private account to which only they can access. Our solution would allow persons with motor disabilities to interact with devices and in this authentication is bit more increased by instead of giving some authentication code by keyboard. This project gives catchphrase and less using of hardware sensors which is using in now a day. To create a secure to authenticate users who are not completely blind. To create a secure password authenticationsystem which uses morse code. To make sure that the required parts of the face are recognized accurately by the system. Since the 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. Look based confirmation alludes to tracking down the eye area across consecutive picture casings and following eye place after some time. Secret phrase verification will do utilizing morse code, where numbers will be addressed in spots and runs. This model presents a continuous

application for looked based pin section and eye recognition and following for [pin recognizable proof utilizing a brilliant camera. Eye trackers give better security contrasted with any biometric confirmation. Eye trackers are the instruments that action the visual exercises. It makes feasible for genuinely incapacitated clients to connect with PCs utilizing their eyes. Our fundamental inspiration is giving validation interaction to individuals from children to elderly folks individuals, which incorporates genuinely tested individuals. Initially, we really want to distinguish a human face only face identification. By applying AI calculations, we can identify the human face. Predominantly this is more relied upon eye squint so when we are identifying face, we really want to recognize the eyes. With the goal that we can count the eye squints given by client utilizing morse code. In this we utilize a portion of the AI calculations to identify the face like Haar Cascade calculation. It is utilized to recognize an article. Calculation used to distinguish faces in a picture or ongoing video. Haar Cascade is an AI based methodology where a great deal of positive and negative pictures is utilized to prepare the classifier. After that we really want to identify the facial milestones particularly eyes through shape indicator. Finally, we really want to identify the eye flickering through eye understudy proliferation.

II. LITERATURE OUTCOMES

Author	Year	Methodology	Advantages	Limitations
PA de Lima Medeiros	2021	Real-time eye blink detector system is used for ALS patient for login authentication system.	Design and implementation of an eye- state using a well processed approach.	The implementation in the ALS patients with severe problem may lead to low efficiency in eye-blink process.
Zeeshan Ali Haq Ziaul Hasan	2016	The first important factor is to detect the portion of eyes. Depending on that person focus the blinking rate is changed.	To reduce the fatality due to drowsiness. As well as it reduces the percentage of accidents.	
R.Revathy R.Bama	2015	Bw method is used for PIN entry. BW method is aimed to resist a human shoulder surfing attack.	Provides high usability and gives compatibility	The shoulder surfer should be able to identity a single digit of the pin in the group of patterns.
Mohamed Florian Mariam Emanuel Regina Andreas	2016	Look contact pass, is a multimodel verification plot in which client characterize and enter through touch	Look contact Pass accomplishes a harmony among security and ease of use with low verification.	Applicable only for mobile devices.
Anjith George AurobindaRoutray	2016	Gaze direction which is real time framework used to detect the eye direction.	Algorithm is robust against noise, blur and localization errors.	The computational complexity of the algorithm in testing phase is less.
Zhenjiang Li Mo L Prasant Mohapatra Jinsong Han Shuaiyu Chen	2017	iTyping is proposed system in this paper	iType system overcomes a challenges accuracy, latency and mobility	Quite low precision of gaze tracking for mobiles.
Kumar kranthi	2020	Left-Right pattern is used for detection of blinking	Low-cost software which converts the message into understandable language through eye blink.	Blinking system is not accurate.

III. FLOWCHART

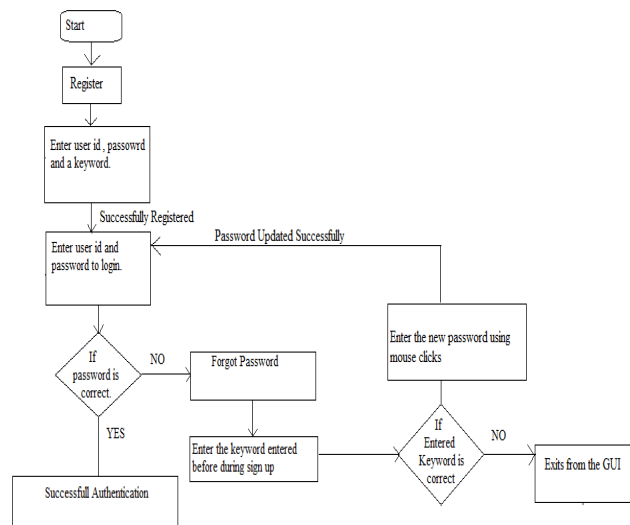


Fig. 1 Flow Chart

IV. SYSTEM ARCHITECTURE

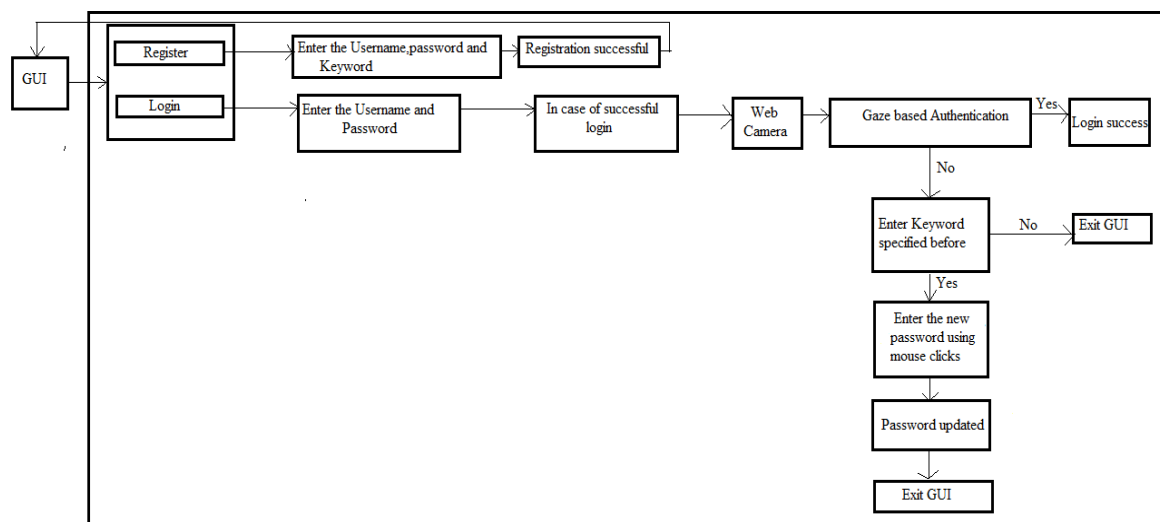


Fig. 2 System Architecture

In the above fig, represents the architecture or the essential design that's required for the implementation of the model. The model consists of a 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.

V. IMPLEMENTATION MODEL

When the user firsts open this application a GUI (Graphical User Interface) will prompt the user whether he wants to login or register as a replacement user. When the user registers they have to supply the specified credentials like user id, password and keyword. The inputs are stored during a database. When to user must login then they need to enter the right credentials which that they had given while registering. If the credentials match

those which got once, they had registered then the authentication is successful. If the credentials aren't matching then they need to answer the safety question with the keyword which that they had given once they had registered at the beginning. If the keyword matches then the user can update the password using the mouse buttons. The updated password is modified within the database. Hence subsequent time the user logs in they will use the new password which they need set. during a scenario where the keyword doesn't match then the user exits from the GUI application.

A. Image capture

After login the user system camera will get enabled without asking any permission and then the system will start saved in the dataset. So, after successful image capturing the user will get a alert box with the message registration success

B. Face detection

Face detection is the next step of the system framework. It determines later stages are going to work or not. In this we used Harcascade algorithm which is used to identify an object detection to identify images in real time image capturing. This algorithm uses edge or line detection features. Haar cascade benefits are that they are very fast at computing Haar like features due to the use of integral images.



Fig. 3 Face Detection with all 68 co-ordinates

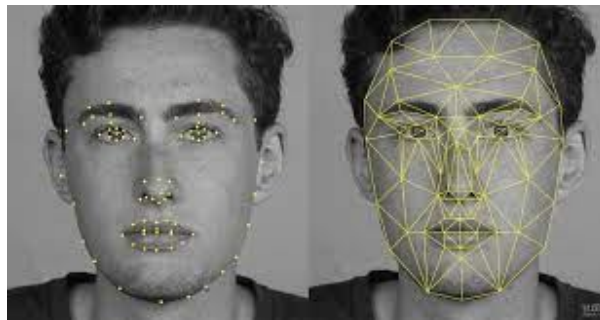


Fig. 4 Face Detection

C. Eye detection

The proposed system will focus only on eye region. So, the needed step is extracting the eye region from whole face. The eye region is extracted from the human face by discarding the lips, nose and other unwanted regions of the face as shown in below figure.

D. Eye blink detection

The blink detection stage is the final stage in our proposed system. The blink detection process divided into two parts to decide if the eye is closed or open. The two parts described in a more detailed blow:

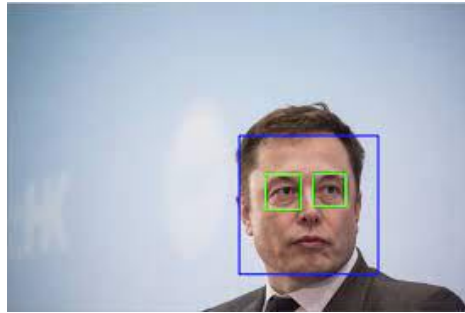


Fig 5: Eye Detection

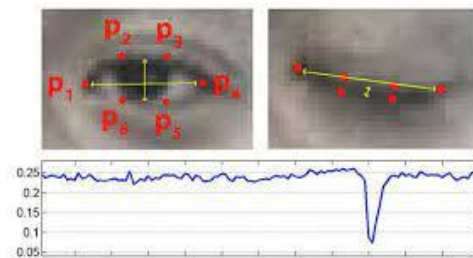


Fig. 6 Eye Blink Detection

E. Morse code

The term Morse Code refers to either of two systems for representing letters of the alphabet, numerals, and punctuation marks by an arrangement of dots, dashes, and spaces.

MORSE CODE TABLE			
A · -	N - ·	1 · - - - -	Ñ - - · - -
B - · · ·	O - - - -	2 · · - - -	Ö - - - ·
C - · - ·	P · - - ·	3 · · · - -	Ü · · - ·
D - · ·	Q - - · -	4 · · · · -	, · · - · ·
E ·	R · - ·	5 · · · · ·	. - - - - ·
F · · - ·	S · · ·	6 - - · · ·	? · · - - · ·
G - - ·	T -	7 - - · · ·	; - - · · ·
H · · · ·	U · · ·	8 - - · · ·	: - - - · ·
I · ·	V · · · -	9 - - - · ·	/ - · · · ·
J · - - -	W · - -	0 - - - - -	+ · · - · ·
K - · -	X - · · ·	À · · - · ·	- - - - -
L · - · ·	Y - - - -	Ä · · · ·	= - · · · ·
M - -	Z - - · ·	É · · · · ·	() - - - - -

Fig. 7Morse Code

VI. SCOPE OF THE PROJECT

Main scope of this project is to avoid frauds happening in bank or any government zones. Eye trackers provide better security compared to any biometric identification. Eye trackers are the instruments that measure the visual activities. This makes it possible for physically disabled users to interact with computers using their eyes. Our main motivation is to provide authentication process for people from kids to old people from kids to old people, which incorporates physically challenged people.

VII. FUTURE WORK

These can be implemented not only to people who have body disorders or speaking issues but also be implemented in places like libraries, hospitals or schools in order to maintain these places with less or no sound and the process of communication. These work great for spy or people working in military to convey secret message without another person's knowledge. Due to Covid going to ATM and withdrawing money is hectic. So, it's better if we could implement this eye blink system in ATM's. However, if anyone is there is ATM, we feel insecure so we can start implementing this first in metropolitan cities and then slowly it can spread other cities.

VIII. CONCLUSION

From below research papers which are taken as reference paper for our project are so useful and there is a lot of information. There are many drawbacks in existing system of eye blink detection. Eye blink detection is a very challenging in real time application. This application is used for all physically challenged people who cannot interact with the system or any devices. This will help for password authentication using morse code. We can conclude by saying eye blink detection is implemented in different approaches but accuracy of it matters a lot.

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