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DEVELOPMENT OF RETINA BASED BIOMETRIC AUTHENTICATION TOOL FOR UNIVERSITY SECURITY SYSTEM

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ABSTRACT

A security system is a kind of a command module, which is the foremost controller of a security system it includes Door and window sensors, Motion sensors, both interior and exterior. Wired or wireless security cameras. A high-decibel siren or alarm & a login with username & password as well. The basic purpose of Security system is to prevent and the detection of unauthorized access to your valuable resources. The security system involves the process of safeguarding against intruders from using your precious resources for the unethical intents or for their own gains or even gaining access to them accidentally. The system with username & password can easily be breached now a day by using different techniques. In this work entitled "University Security System" we are not allowing the attacker to access our highly valuable resources. In this work, we have designed a tool which will verify the uniquely identified information about the authenticated user. Later on, this information will be used for the future verification with the stored the stored dataset. If the captured information matched with the stored data set, then the person is considered as the authenticated. In this project we are making the biometric verification using the retina sample of the specific person.

Keywords----Student, Faculty, Admin, Security System, Retina

I.INTRODUCTION

Biometrics are computerized strategies for perceiving a man in view of a physiological or behavioral trademark [3]. Among the highlights estimated are; face, finger print, hand geometry, iris, retinal, signature, and voice. Biometric innovations are turning into the establishment of a broad exhibit of exceedingly secure recognizable proof and individual confirmation arrangements [1]. As the level of security breaks and exchange misrepresentation builds, the requirement for profoundly secure recognizable proof and individual confirmation advances is getting to be obvious.

Biometric-based arrangements can accommodate secret budgetary exchanges and individual information protection [4]. The requirement for biometrics can be found in elected, state and neighborhood governments, in the military, and in business applications [2]. Endeavor wide system security foundations,

government IDs, secure electronic keeping money, contributing and other monetary exchanges, retail deals, law requirement, and wellbeing and social administrations are as of now profiting by these innovations.

Biometric-based confirmation applications incorporate workstation, system, and area get to, single sign-on, application logon, information assurance, remote access to assets, exchange security and Web security [3]. Trust in these electronic exchanges is fundamental to the solid development of the worldwide economy. Used alone or coordinated with different advancements, for example, brilliant cards, encryption keys and computerized marks, biometrics are set to swarm almost all parts of the economy and our everyday lives. Using biometrics for individual confirmation is getting to be helpful and significantly more precise than current techniques, (for example, the usage of passwords or PINs) [7]. This is on the grounds that biometrics interfaces the occasion to a specific individual (a watchword or token might be utilized by somebody other than the approved client), is advantageous (nothing to convey or recollect), precise (it accommodates positive validation), can give a review trail and is ending up socially adequate and reasonable [4].

Retina based biometric includes dissecting the layer of blood vessels arranged at the back of the eye. A built up innovation, this procedure includes utilizing a low-force light source through an optical coupler to filter the interesting examples of the retina [9]. Retinal checking can be very exact however requires the client to investigate a container and spotlight on a given point. This isn't especially helpful on the off chance that you wear glasses or are worried about having close contact with the perusing gadget [10]. Hence, retinal filtering isn't warmly acknowledged by all clients, despite the fact that the innovation itself can function admirably.

The system with username & password can easily be breached now days by using different techniques. In this project entitled “University Security System “we are not allowing the attacker to access our highly valuable resources.

The University Security System will be having three end users:

1. Student
2. Admin
3. Faculty

The following system will allow the users to get their required information in a very less amount of time .In the current system ,all of the users have to get logged into their system with the help of their username & password. Now a day lot of techniques are being developed which can be used to crack the username & password .In our system, we will not allow the user to input the username & password but the user will input the image of their cornea for the login.

II.THEORY AND BACKGROUND

Retinal Recognition of an individual is finished by securing an interior self-perception, the retina of an individual lApart from other biometric things; retinal recognition isn't generally used in business applications. While considered much invasive and costly, retinal recognition is as yet the most strong and stable methods

for biometric identification. Although the advantages of retinal recognition at present bypassed the barrier, its across the board utilize is kept down by open acceptance. The retina is actually a thin layer of cells located at the other side of the eyeball of vertebrates. It is the part of the eye which varies over light from nervous signals. The retina consists of various layers of palpable tissue and a massive count of photoreceptors (cells) whose volume is to change light spar to neural impulses. These inducements accordingly go to the cerebrum along the optic nerve, where they are changed over to photos. Two distinctive sorts of photoreceptors survive interior the retina: the rods and the cones. While the cones (6-million for every eye) assist us to see unique hues, the rods (125million for each eye) stimulate night and fringe vision. It is the engaging form of the vein representation in the retina that designs the creation for retinal recognition and has been utilized for biometric identification.

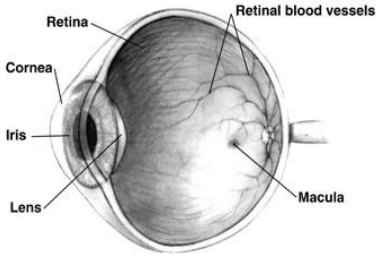


Fig 1. Anatomy of an eye

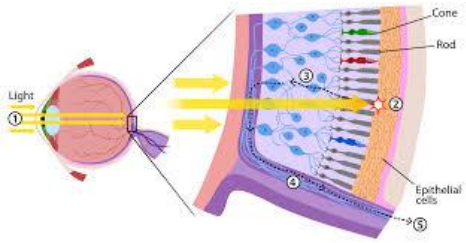


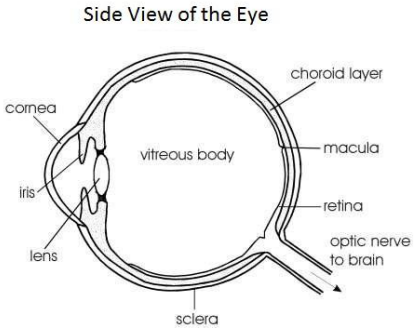
Fig 2. Rods and Cons

2.1.1 Retina Vs Iris

When discussing on the eye, particularly in the context of biometrics, the iris and the retina are frequently demented. While they may both be grouped as 'eye biometrics', their own tasks are completely unique. The iris is the colored band of tissue that is neighboring the pupil of the eye. The key motive of the iris is to widen and shrink the size of the pupil. In this perception, the iris is similar with the breach of a camera. The retina is a narrow sheet of cells at the rear of the eyeball of vertebrates. It is said that the retina "is to the eye as film is to a camera."

2.1.2 Side Vision of an Eye

The iris is positioned in the forepart of the eye, while the retina is positioned at the rear. Due to its location interior of the eye, the retina isn't introduced to the exterior state. As a biometric, it is in this fashion exceedingly stable.



2.1.3Front perspective of the vein design inside the retina

The red rules talk to the genuine blood veins; the yellow zone exhibits the location of the optic disk (where the optic nerve connects the retina). It is from here that information is conveyed to and gotten from the mind. The hover in the reveals the area that is normally seized by a retinal scanning gadget. It contains an exceptional example of veins.

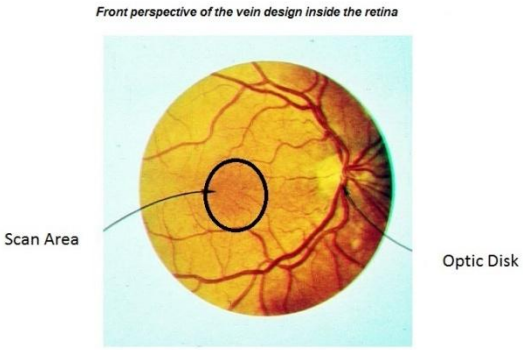


Fig 3. Front view of the vein

III.EXPERIMENTAL DESIGN AND RESULTS

In our system entitled “University Security System”, we have three end users: Students, Faculty and Admin. When we run the Java code, we get the Login Interface where we have two options:

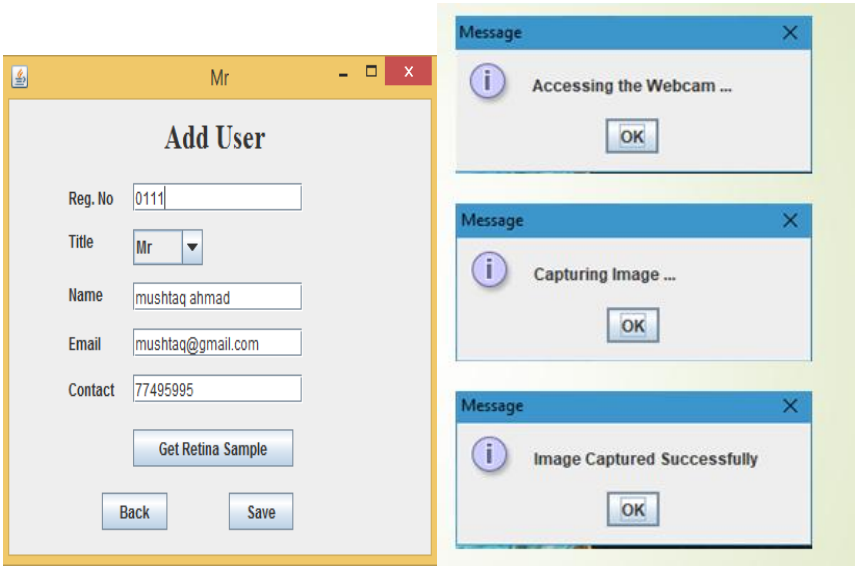
1.1 Manager Login

3.2User Login

3.1 Manager Login

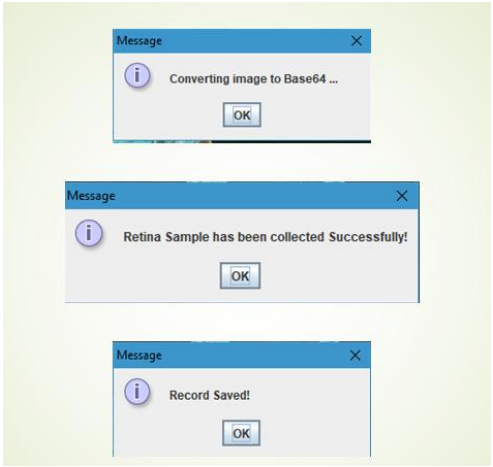
In manager login, admin has to enter User ID and Password. After logged in , a pop up window will show the message “ Login Successful” . After logged in successfully , a window will pop up named “ Admin Control “ where admin will be given “ User Management” button and clicking on it will lead it to another window where

admin will find Add User , Delete User Find The user buttons . In the Add User button, admin has to provide the every detail of the user (Student) including its name, registration number, email, contact and retina sample . After entered every detail of the user, admin will click on the "Get Retina Sample". Soon clicking on this button Web cam of the PC will be accessed and the image will be captured and converted into base 64. The whole information of the student will be saved in the database. This is the whole process from the Manager Login Side.



In Manager Login Side, we are observing two processes:

- **3.1.1** Retina Storage-- Capture the eye snapshot using ordinary camera. Convert this image into the base64 which will return the code of the image in the form of string. Retrieve the retina from this converted image .Store the extracted retina into the database.



- **3.1.2** Comparing the Retina-- Capture the eye image. Convert it into base64.Extract retina from it. Compare it with the stored retina into the database. Return Authenticated, if matched Return error, if not matched.

3.2 User Login

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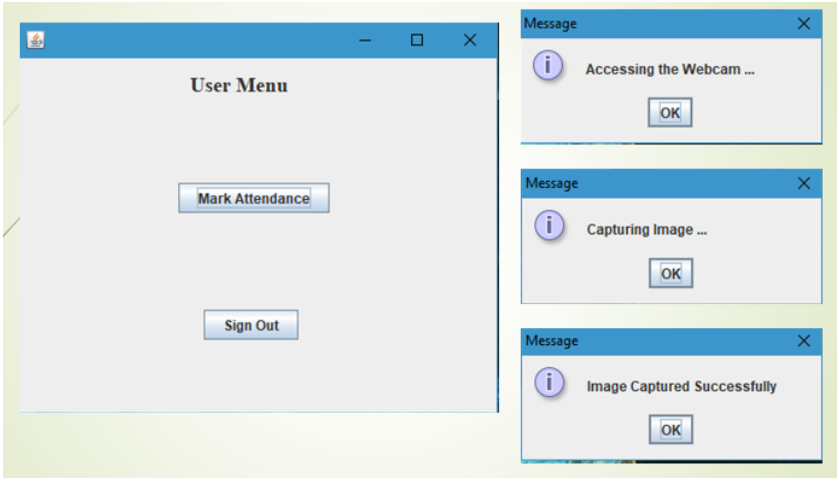
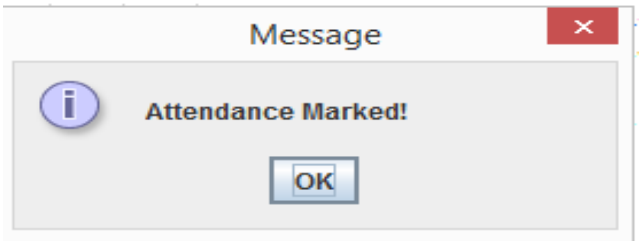
In User Login mode, student after successfully logged in will be provided with the pop up window as shown in the figure below:



Soon after clicking on the "Mark Attendance" button, camera will be accessed and image will be captured. The capture image will be converted into base 64(same process as done in the Manager Login mode) and this base64 is compared with the sample stored in the database. If the samples matched, the attendance will be marked as pop up:



Else it will show that the retina sample is invalid. This is how the system will work. The other stored results will be in the database as:

Options	Reg.No	Title	Name	Email	Contact	Ret_Sample
Edit Copy Delete	0009999	Mr	sid malik	msidd@gmail.com	70808080606	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	0110033	Mr	m ahmad	ahmaf911@gmail.com	55060708808	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	0111123	Mr	Mushtaq Ahmad	elixir433@gmail.com	7006883475	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	023498	Mr	Prem Sir	prems@gmail.com	60708809060	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	0345	Mr	abcd	dkgkg@gmail.com	60770780	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	05677	Mr	Gaurav	gkumar@gmail.com	677899	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	066000	Ms	Sid Malik	gkgf@gmail.com	557789999	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	0888	Mr	Ritik	ritik123@gmail.com	79976788	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...
Edit Copy Delete	S1100	Ms	Sidd Malik	smalik@gmail.com	696494903	iVBORw0KGgoAAAANSUhEUgAAAoAAAAHgCAIAAAC6s0uzAACAAE...

IV.FUTURE SCOPE

Endeavor and government both recognize the joining of physical and information security situations, yet there is new security challenges not too far off – in the nick of time stock control, complex production network administration, and even a wonder called "competition"- in which organizations that contend in a few zones, coordinate in others.

Dealing with this merging of physical and information security prerequisites now drives security framework engineering plan and execution, and is an inexorably enter factor in biometric innovation choice. Overseeing meeting will just turn into a more mind boggling assignment in light of the fact that as the IT and correspondences turns out to be progressively remote, the requirement for vigorous personality administration will turn out to be more intense.

Retinal Recognition sees retina innovation as a characteristic "fit" for in the physical, infosec, and remote fields. We imagine a day when retina acknowledgment innovation will be sent in ways that take out misrepresentation, give non-revocation of offers, confirm stores exchanges, give signature check, MasterCard approval, and approved access to medicinal services records, licensed innovation, thus considerably more.

This developing need, and additionally Retina Scan skill in retina innovation, combined with center interests in IT and remote, gives the force to plan endeavors for the future – and makes Retina ID the one to look for new advancements in character administration tomorrow and past.

V.CONCLUSION

The essential reason for Security framework is to counteract and the recognition of unapproved access to your profitable assets. The security framework includes the way toward defending against interlopers from utilizing your valuable assets for the deceptive goals or for their own increases or not withstanding accessing them coincidentally. The framework with username and secret key can without much of a stretch be broken now daily by utilizing distinctive methods. In this undertaking entitled "University Security System" we are not enabling the assailant to get to our very significant assets.

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